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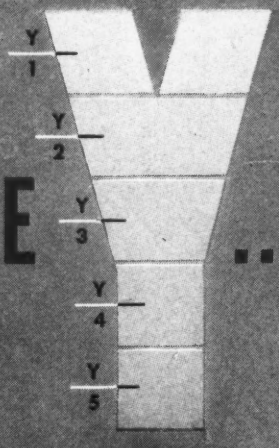

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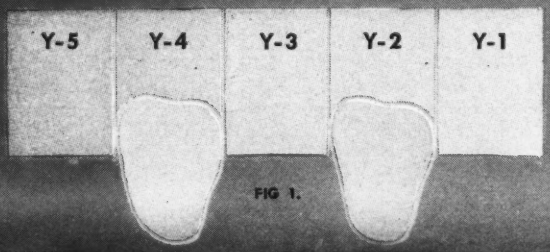

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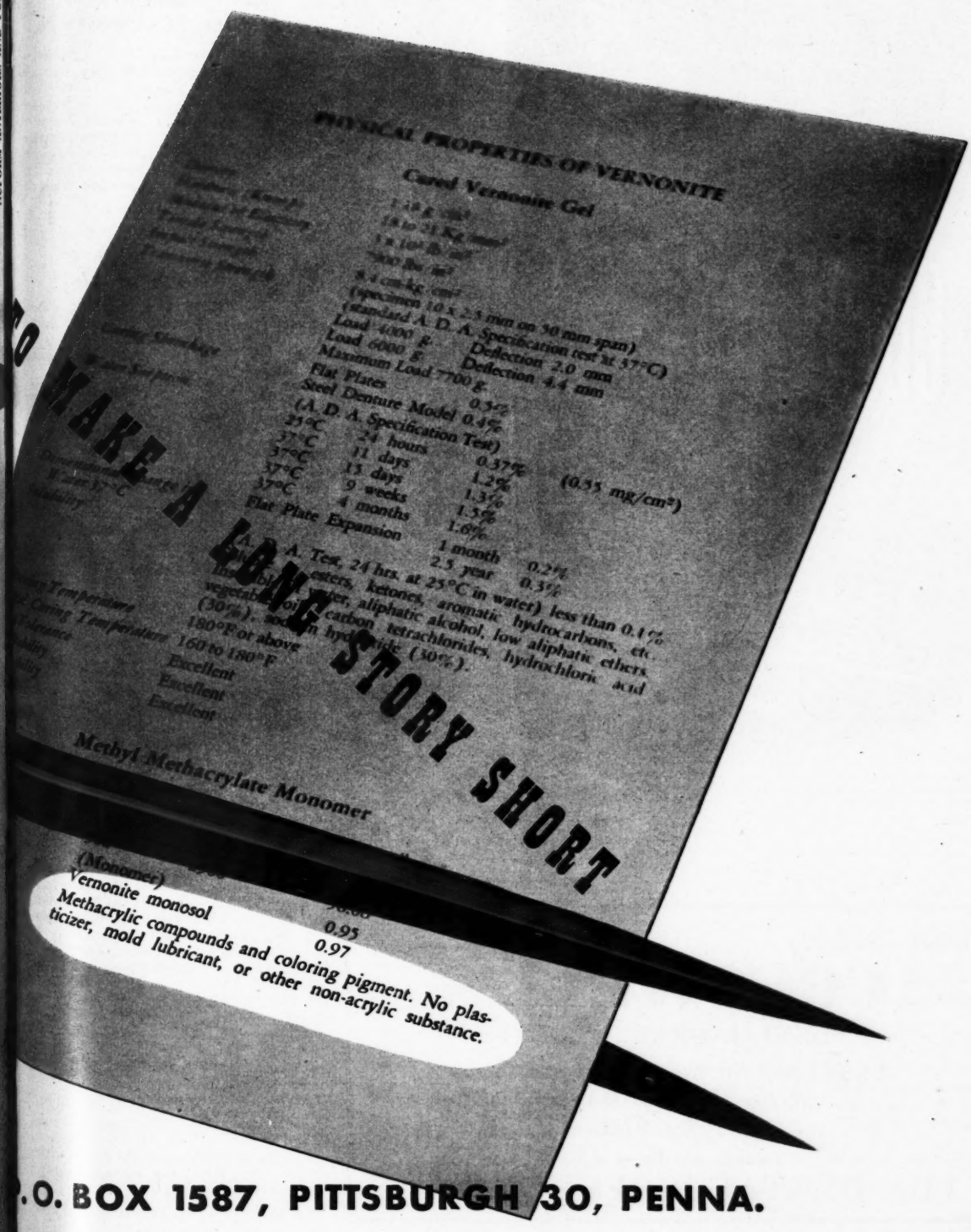
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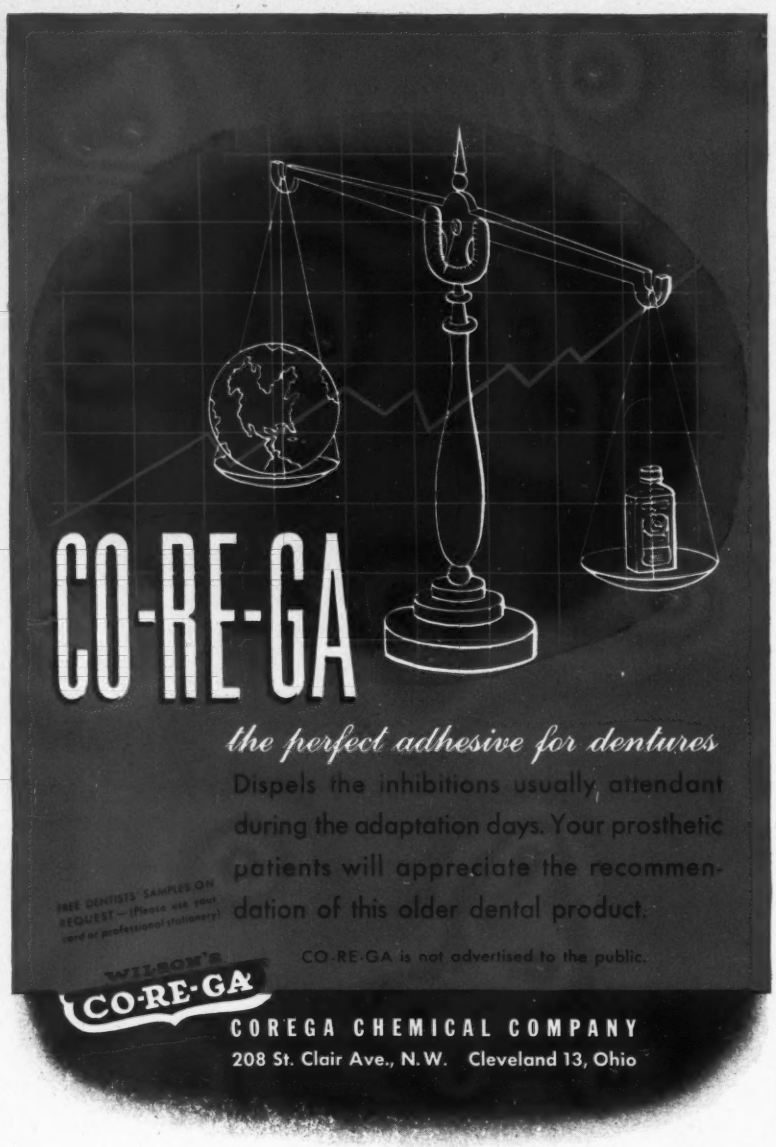
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708 CHURCH STREET
EVANSTON, ILLINOIS

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EDWARD J. RYAN, B.S., D.D.S., *Editor*
ETHEL H. DAVIS, A.B., *Assistant Editor*
(In Military Service)
RUTH K. BARNHART, *Assistant Editor*
708 Church Street, Evanston, Illinois

About Our CONTRIBUTORS

MONT CLAIR CARPENTER, D.D.S. (Kansas City-Western Dental College, 1902) is in general practice. He describes here a method for making full dentures with the use of soft posterior teeth to permit the patient to establish his own registration.

LIEUTENANT COLONEL CLINTON T. BRANN (DC), AUS, received his D.D.S. at the State University of Iowa, College of Dentistry, in 1916. Previous to entering military service, Colonel Brann practiced in Davenport, Iowa. CAPTAIN GUSTAV T. DURRER (DC), AUS, now on foreign duty, limited his practice in New York City to prosthetic dentistry. These co-authors report a case of raising the bite for a patient who had severe loss of vertical dimension and complete loss of occlusion of the teeth.

LIEUTENANT GILBERT J. FLEIG, DC-V(S), USNR, was in general practice in Cherokee, Iowa, prior to entering military service. He received his D.D.S. at the State University of Iowa, College of Dentistry, in 1927. He discusses here THE SURGERY OF JAW CYSTS.

MARVIN M. SUGARMAN, D.D.S. (Atlanta-Southern Dental College, 1938) is a general practitioner. Doctor Sugarman describes the use of electrosurgery in treating overlapping and hypertrophied tissue, gingival growths, and periodontal disease.

DONALD V. SUMMERVILLE, D.D.S., contributes this month the second of his two articles on AVIATION DENTISTRY. He discusses the dental and medical discomforts associated with flying at altitudes above 8,000 feet. Doctor Summerville's discussion of the basic atmospheric, physiologic, and chemical conditions present in high altitude flying appeared in this magazine last month, at which time additional biographic information was published.

IRVING E. LABY, D.D.S. (Chicago College of Dental Surgery, 1919) limits his practice to corrective and reconstructive dentistry. Doctor Laby has contributed numerous articles to dental publications. He wrote for us in June 1936, July 1939, and September 1942. We now present his technique for the use of acrylic in bridge construction.

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A Simplified Procedure in Full Denture Construction

MONT C. CARPENTER, D.D.S.,
Kansas City, Missouri

DIGEST

A simplified method is described for making full upper and lower dentures with the use of posterior teeth soft enough to permit the patient to establish his own registration. The patient cuts his own occlusal paths in the soft teeth, using his jaws as an articulator. These teeth are then reproduced in acrylic.

Technique

1. Take impressions carefully, and pour stone models.

2. Make bite blocks and insert them in the mouth for correction. Establish the verticle dimension, and register the centric relation.

3. Mount the casts on an articulator after the shade and mold of the teeth have been determined. I prefer to use all porcelain teeth in the upper denture, and only porcelain anteriors in the lower denture. Plastic teeth can be used in a full upper denture, however, against the patient's natural lower teeth or against a porcelain full lower denture.

4. Set up both the upper and lower anterior teeth.

5. Place a plastic molar tentatively in each lower second molar region.

6. Set up the porcelain upper posterior teeth. Care should be taken in checking the occlusion of the upper first and second molars with the plastic lower second molars.

7. Open the articulator enough to permit a thickness of approximately

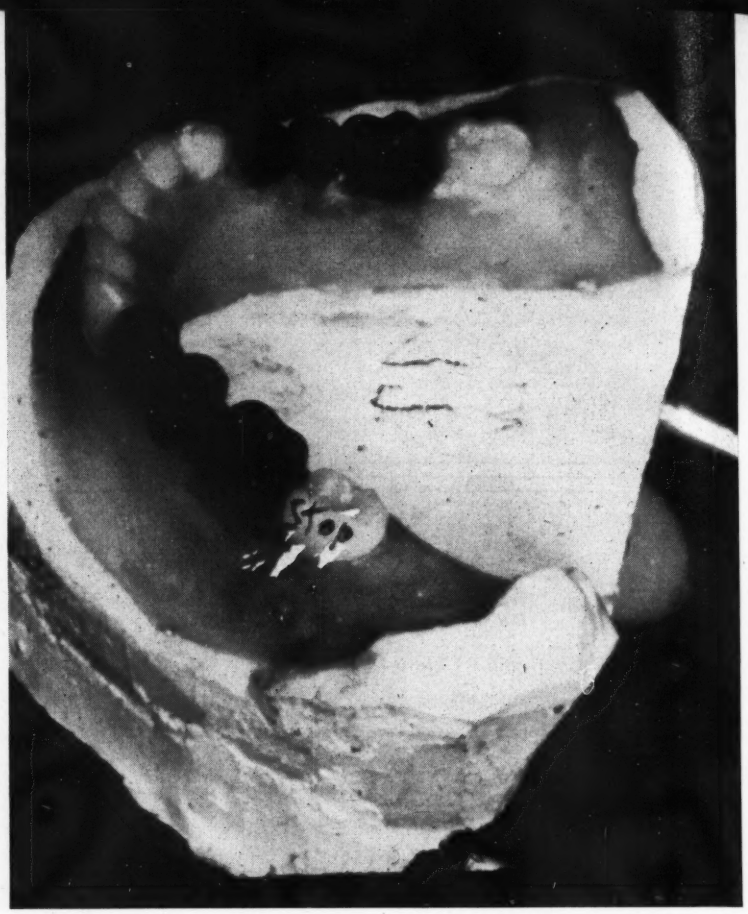


Fig. 1—Porcelain lower anteriors; wax teeth carved enbloc; acrylic second molars without carding wax.

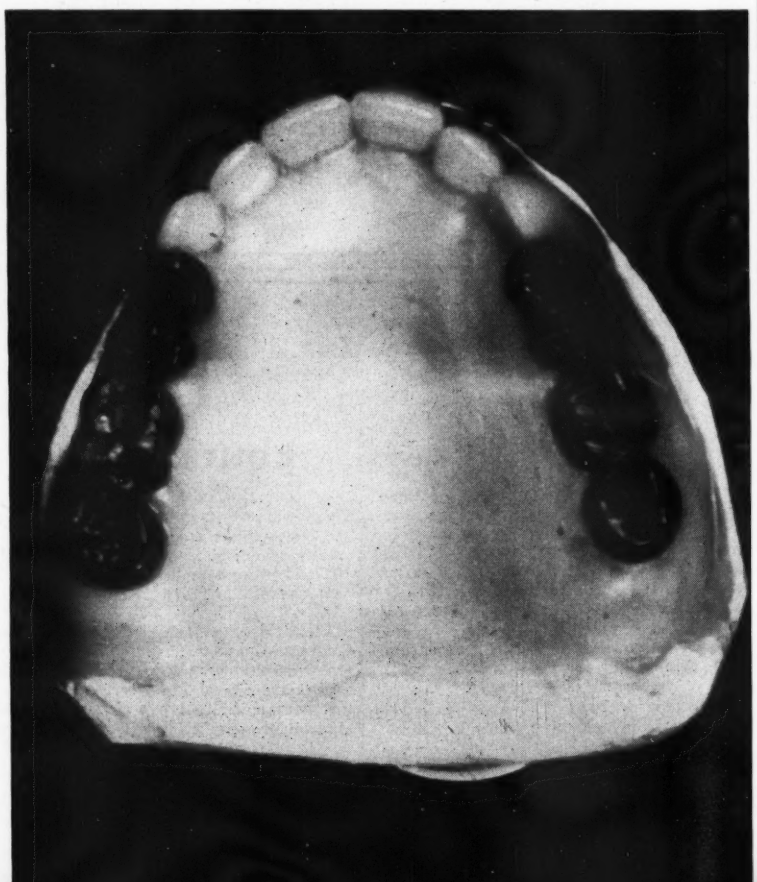
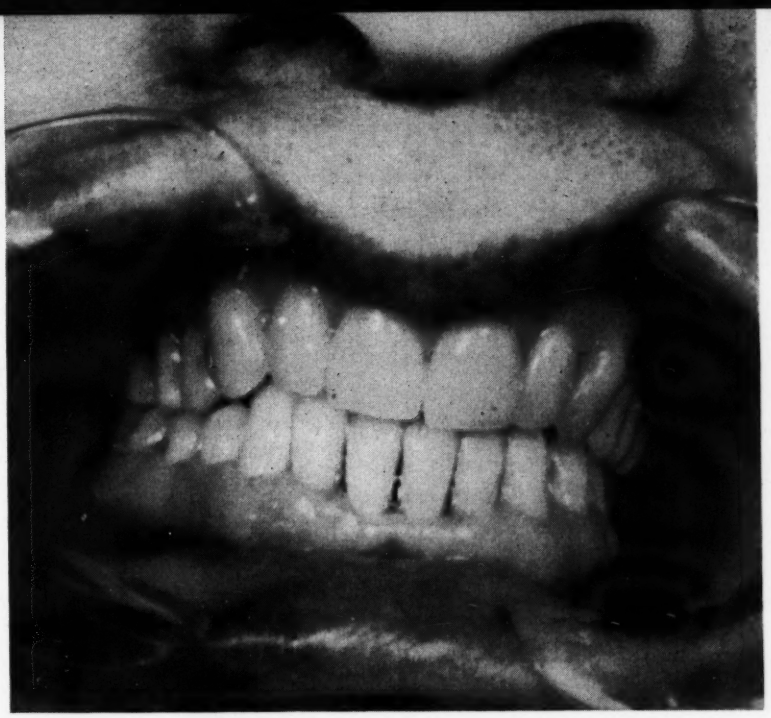


Fig. 2—Upper denture with posterior teeth in wax.

Fig. 3—Completed upper denture with porcelain anteriors and acrylic posteriors against the patient's natural lower teeth.

Fig. 4—Left: Baseplate wax form filled with artificial stone on the left. Right: Mold ready to be poured with melted inlay wax, making wax teeth enbloc with well defined cusps.

Fig. 5—Left: Mold well lubricated to keep wax from sticking. Right: Mold poured with melted wax. Center: Wax posterior teeth. Purple wax can be used but Peck's colorless inlay wax is recommended.



1½ millimeters of carding wax to be added to the cusps of the plastic lower second molars.

8. Add the first molars and bicuspids to the lower denture. This is accomplished by using wax teeth molded enbloc for this purpose from colorless inlay wax. The upper porcelain teeth are now in approximate occlusion with the lower wax teeth. The articulator is no longer needed. Set the lower denture aside until the next appointment with the patient.

9. Remove, process, and polish the upper denture.

10. At the next appointment, put the finished upper denture in place and check it for fit. Try the unfinished lower denture in place. If the wax teeth are too long, apply a warm spatula to them, and instruct the patient to move the jaw from side to side; inspect the lower denture. Repeat this procedure until the porcelain upper second molars cut through the carding wax on the plastic lower second molars; the plastic teeth act as a stop. In this way the patient registers his jaw movements in the wax first molars and bicuspids.

11. Remove the lower denture, and carve fissures in the first molars and bicuspids. Clean the carding wax off the plastic second molars. Inasmuch as these teeth act as a stop, the verticle dimension is now the same as the dimension on the articulator.

12. After processing, the finished lower denture has plastic posteriors. The second curing is not injurious to the plastic second molars.

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Bite Raising: Case Report

Lieutenant Colonel C. T. Brann (DC), and Captain G. T. Durrer (DC), AUS

DIGEST

The case of a patient with extreme protrusion of the lower jaw and loss of dental occlusion is reported from an Army dental clinic. The patient's appearance was improved greatly by properly planned and executed prosthetic appliances.

History

The patient, aged 33, had excessive protrusion of the lower jaw. He likewise had severe loss of vertical dimension due to malocclusion and the loss of several teeth. There was no occlusion of the upper and lower teeth. Figures 1 and 2 show the profile and front views of the patient.

Prior to entering Army service, the patient had lost the maxillary right lateral incisor, right first and second molars, left cuspid, left first bicuspid, and left first and second molars; and the mandibular right lateral incisor, right first bicuspid, right first and second molars, and left first and third molars. The left upper cuspid and first bicuspid had been replaced by a bridge.

The loss of vertical dimension gave the patient an unfavorable appearance. He compensated for this handicap by holding a piece of cloth or some other object between the teeth in an effort to hold the bite open. Figures 3, 4, and 5 show the malocclusion and protrusive bite, and the complete lack of chewing surface. Because of an almost complete lack of proper mastication, the patient complained of digestive disturbances.

Previous treatment had consisted only of the necessary restorations, extractions, and the bridge. The patient had been told that correction of the deformity was impossible. He was, therefore, hesitant to accept treatment outlined by us. After a complete explanation of the intended treatment was made, he agreed to cooperate.

Preparation of the Mouth

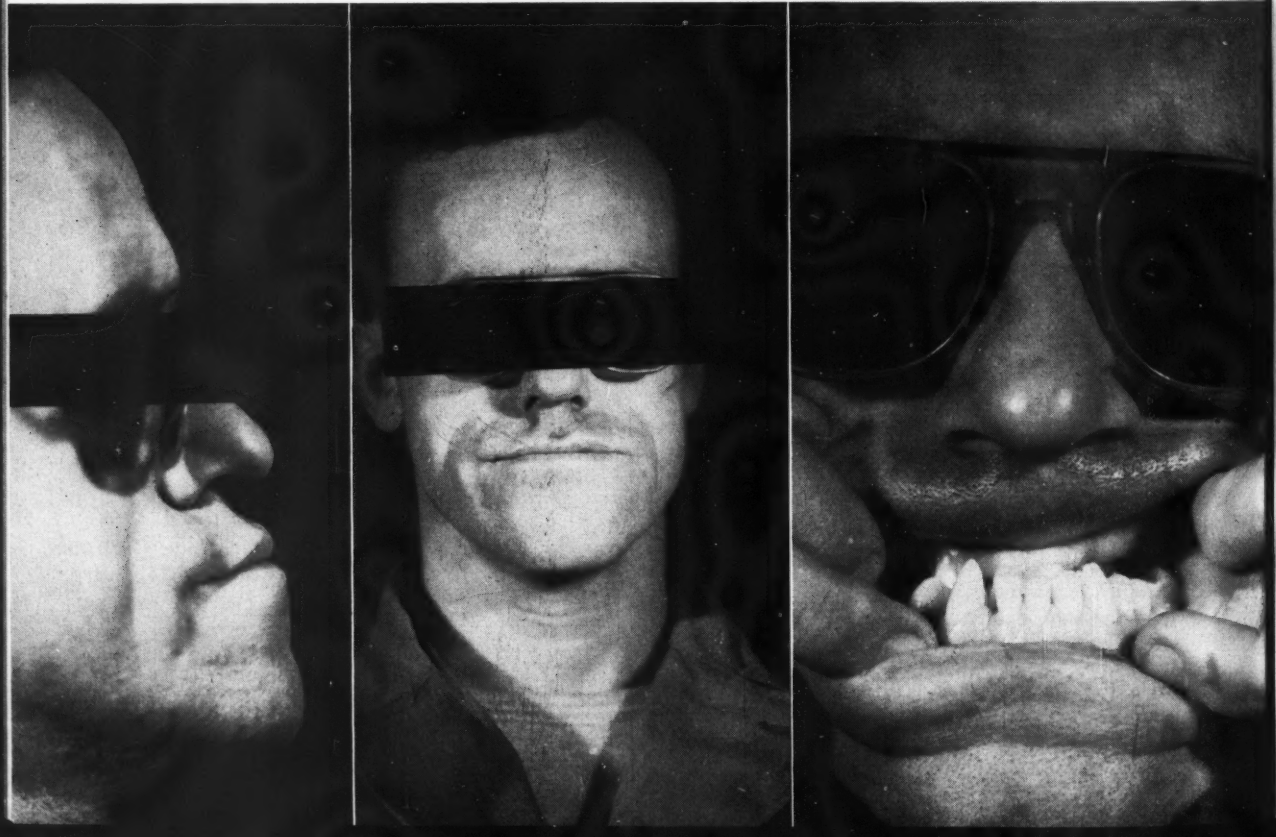
1. Roentgenograms of both temporomandibular joints were taken inasmuch as pathologic changes due to the overclosure were anticipated. No disturbance was apparent, however, and full mouth roentgenograms were negative.

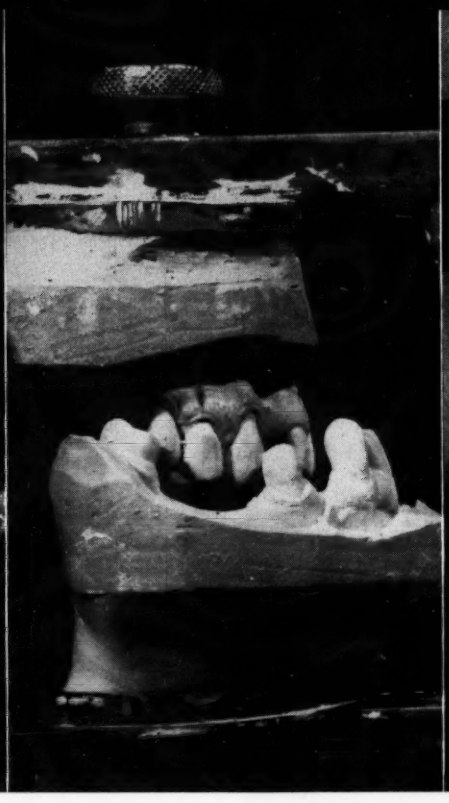
2. Impressions were taken, and study models were made and mounted on the Hanau articulator (Figs. 4 and 5).

3. A splint in modeling compound was constructed to determine the amount of opening necessary. It was

Figs. 1 and 2—Profile and front views of patient before treatment, showing decreased vertical dimension and protrusion of jaw.

Fig. 3—Extreme malocclusion and protrusive bite. Note loss of right lateral incisor.





Figs. 4 and 5—Study models on Hanau articulator showing extreme malocclusion and protrusive bite, and complete lack of chewing surface.

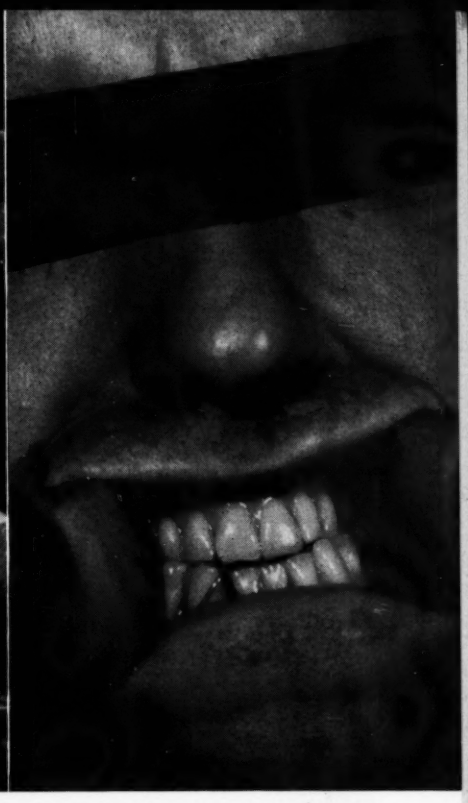


Fig. 6—Lower partial and upper full dentures in place. Note the increased retrusion of the mandible, restored centric relation of the anterior teeth, and adjusted occlusion of the posterior teeth.

estimated that a bite opening of 11 millimeters would be functional and an esthetic improvement. The degree of bite opening was determined by a study of the facial dimension and expression as well as of the parallelism of the ridges. The accepted vertical facial measurement, in which the distance from the base of the nose to the lower edge of the mandible equals the distance from the pupil of the eye to the parting line of the lips, was not true.

4. After careful study, it was decided that removal of the upper teeth was necessary; this was done. The alveolar process was trimmed, and the soft tissues were sutured to promote quick healing. The mandibular right second bicuspid and left second molar were removed.

5. The plane of occlusion of the lower teeth was adjusted by grinding, and definite lug seats were prepared on the abutment teeth. The right cuspid, right third molar, and left second bicuspid, were used as abutment teeth for the lower partial denture.

The technique described by Doctor I. R. Hardy in this magazine in February 1938[1] was followed on the cuspids. In this technique the lug seat is prepared by creating a notch in the cutting edge of the tooth with a knife-edged stone at a point about one third of the distance from the mesio-incisal angle to the crest of the cusp. The notch is carried well over the labial side into the lingual enamel plate. This forms a definite lug seat on the incisal edge. The lug and the lingual aspect of the clasp consist of a rigid casting. The labial arm of the clasp consists of a round wire soldered to the casting. The other clasps were constructed with a round wire and soldered lugs.

Construction Procedure

1. Impressions were taken for a full upper denture and a partial lower. The closed mouth impression technique with zinc oxide paste was used for the full upper impression, and a colloid material was used for the lower partial impression.[2]

2. Wax rims were built, and the bite was opened to the previously established measurement of approximately 12 millimeters. One millimeter of additional opening was provided to permit adjustment of the occlusion on the finished denture.

3. Centric relation was determined by means of intra-oral Gothic arch tracing with a central bearing point.[3] Because of the opening and the now increased retrusion of the mandible, it was possible to bring the anterior teeth into an almost edge-to-edge position. The incisors, however, were kept out of occlusion in order to preserve the anterior ridge and to prevent dislodging of the denture.

4. The cusps of the posterior teeth were reduced to facilitate setting them up exactly over the ridges, inasmuch as the lower ridge was in a buccal position in relation to the upper ridge. The elimination of cusps on the posterior teeth tended to reduce the excessive leverage created by the great amount of intermaxillary space. The bite in the finished denture was ground in care-

[1]Hardy, I. R.: Partial Lower Denture Design, THE DENTAL DIGEST, 44:55-60 (February) 1938.
[2]Swensen, M. G.: Complete Dentures, St. Louis, The C. V. Mosby Company, 1940, Chapters 4, 23, and 26.
[3]Hall, R. E.: Full Denture Construction, J.A.D.A., 16:1157-1198 (July) 1929.

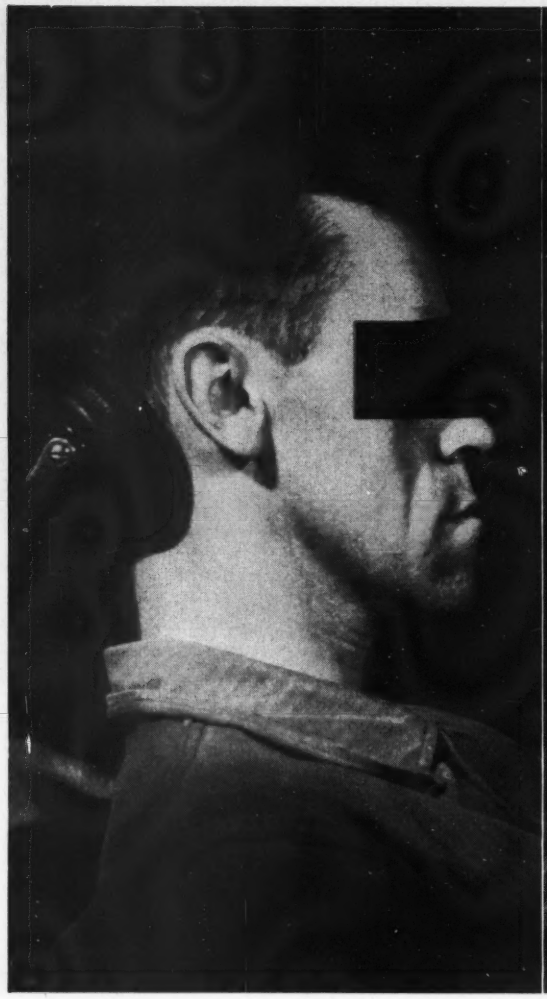


Fig. 7—Profile view of patient with dentures in place.

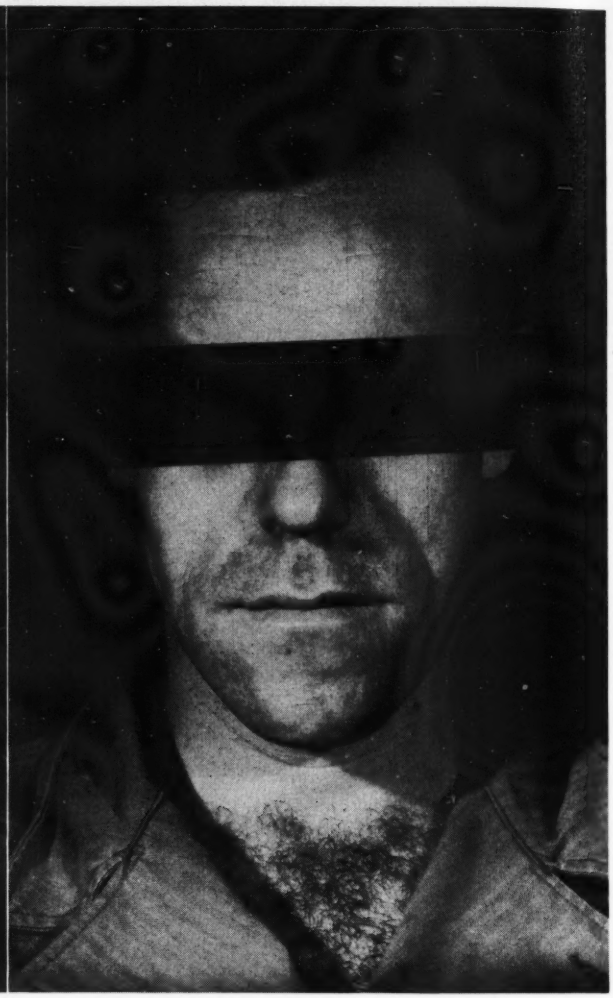


Fig. 8—Front view of patient with dentures in place.

fully to reduce any lateral interference. Some cutting facets were ground into the teeth to provide more efficient masticating surfaces.

Conclusions

There was a marked improvement in the patient's appearance, as can be seen in Figures 6, 7, and 8. The patient expressed his satisfaction upon seeing the final result. The restoration likewise proved stable, comfortable, and efficient, and the patient had surprisingly little speech difficulty throughout and after treatment.

At present, and probably for some time, the patient will experience some difficulty in chewing as a result of the "premature" striking of the teeth. The awkward feeling will gradually disappear as the patient learns to manipulate the dentures, and as the muscles adjust themselves to the new position. The ideal procedure would have been to open the bite gradually by a successive series of dentures, which was not practicable in this instance. Previous self-training had prepared the patient for this amount of opening.

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The Surgery of Jaw Cysts

LIEUTENANT G. J. FLEIG, DC-V(S), USNR, Iowa City

DIGEST

A technique is described for the surgical removal of a jaw cyst, the removal of a maxillary cyst being used as an illustration.

Operative Technique

The following technique may be used for all types of jaw cysts:

1. Prepare the patient for surgery:
   a) Scrub the patient's face with soap and water.
   b) Place sterile towels over the patient's face.
   c) Paint the surgical area.
   d) Make the proper anesthetic injections.
2. Have ready the necessary instruments: tissue elevators, hemostats, tissue scissors, lance (safe shank), forceps, curets (large), sterile gauze sponge, iodoform gauze pack, and suture material.
3. Outline the area of tissue elevation or retraction by studying the roentgenograms.
4. Tissue elevation:
   a) Make the incision, following the original outline determined from the roentgenograms (Fig. 1).
   b) Elevate or retract the tissue with tissue elevators, being sure to separate the periosteal membrane with the mucous membrane from the alveolar process (Fig. 2). It is necessary to have sufficient tissue retraction so that the operator will have a clear view of all the cystic area after the cyst has been removed. It is likewise important that sufficient tissue is retracted to cover the excised process margins on the buccal and labial.
5. Remove all involved teeth.
6. Remove sufficient interproximal, labial, and buccal alveolar process with a rongeur or bone bur to expose the cyst; however, leave all the interproximal process possible to support the replaced tissue (Fig. 3).
7. While holding the cyst with a hemostat, carefully detach or peel the

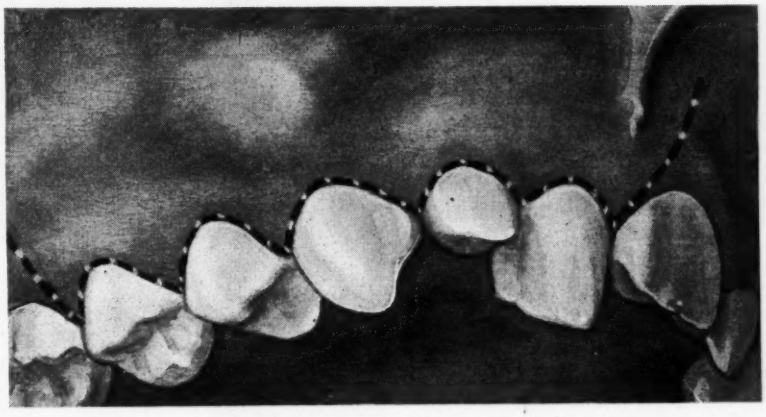

Fig. 1—Make incision following outline determined by roentgenography.

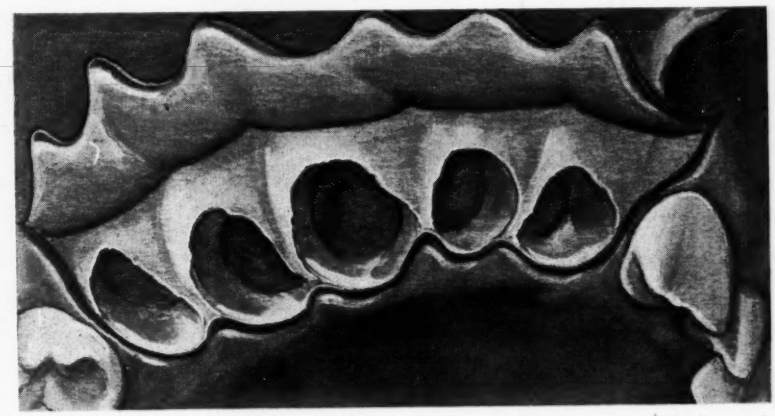

Fig. 2—Elevate tissue, separating periosteal membrane with mucous membrane from alveolar process, and remove all involved teeth. Note clear view of cystic area.

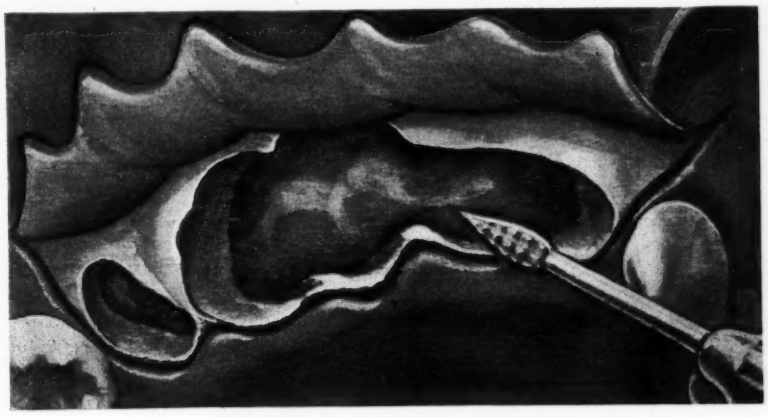

Fig. 3—Remove sufficient alveolar process to expose cyst.

Fig. 4—Hold cyst with hemostat, and detach cystic sac from bony wall with curet.

Fig. 5—Insert iodoform gauze loosely into cavity, leaving one end to protrude from an anterior socket.

Fig. 6—Suture elevated tissue flap after trimming off excess.

cystic sac from the bony wall with a large curet, removing it in its entirety if possible (Fig. 4). Be sure that all the cystic sac is removed.

8. Treatment of area:

a) Curet the cystic area, and paint it with iodine.

b) Smooth all the process margins with a bone file to eliminate sharp spicules or protruberances.

c) Insert iodoform gauze loosely, leaving one end to protrude from one of the anterior sockets (Fig. 5). The use of an iodoform gauze pack is arbitrary, but I prefer to use it in the removal of all large cysts.

d) Spray the area with one of the sulfonamides; sulfathiazole is preferred.

9. Replace the elevated tissue, trim off the excess with tissue scissors, and suture to place (Fig. 6).

Fig. 4

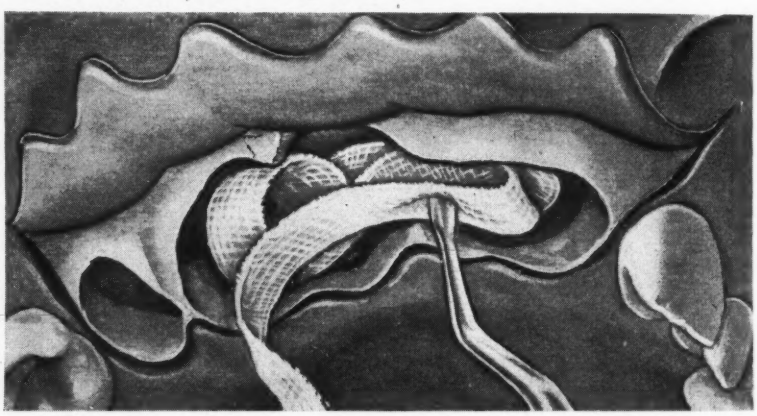

Fig. 5

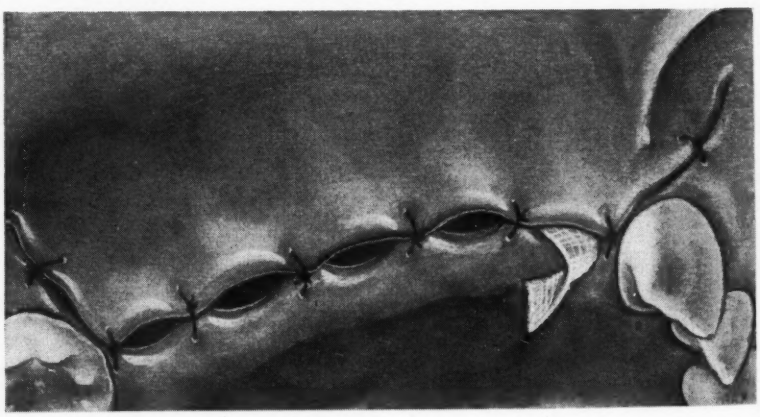

Fig. 6

Postoperative Treatment

1. The patient should be hospitalized for a few days.

2. Ice bags should be applied to the area of surgery for 15 minutes of every hour for the first 24 or 48 hours.

3. Warm irrigations of saline solution should be used over the area of operation at hourly intervals during the first 48 hours.

4. The gauze pack is removed in three portions, one at each 48-hour interval.

Electrosurgery, an Adjunct to the General Practice of Dentistry

MARVIN M. SUGARMAN, D.D.S., Atlanta, Georgia

DIGEST

The uses of electrosurgery in the practice of dentistry are listed, and techniques for its use in treating overlapping and hypertrophied tissue, gingival growths, and periodontal disease are described. A case is reported in which a papilloma was removed from the lower anterior gingiva by electrosurgery.

ELECTROSURGERY, the method of separating tissue by an electric current, is a far better technique than has hitherto been devised for the following operations which are often necessary in the practice of general dentistry:

1. The removal of tissue over partly erupted teeth, especially lower third molars.

2. The removal of hypertrophied tissue which prevents proper cavity preparation or an adequate impression of the cavity.

3. The removal of growths or sections of growths for pathologic study.

4. Surgical treatment of periodontal disease.

The physics of the radiotube or of the electromagnetic field will not be discussed in this article. To master electrosurgery and to obtain good results, however, it is not sufficient merely to have a machine; one must study and understand the underlying principles of electrosurgery.

Overlapping Tissue Problem

The primary considerations in the problem of overlapping tissue must be:

1. Is the tooth worth saving?

2. Is there sufficient anterior-posterior space to allow the tooth to take its proper position?

3. Is development of the roots proper for use as a bridge abutment in later years?

4. Is proper buccolingual alinement obtainable?

Even with these factors favorable, a technique is necessary for remov-

Fig. 1—Third molar flap before treatment.

Fig. 2—Appearance of gingiva of third molar immediately following removal of flap by electrosurgery.

Fig. 3—Healed gingival tissue following removal of third molar flap by electrosurgery.

Fig. 4—Hypertrophied tissue in lower anterior gingiva. Growth had doubled in size in a year.

ing the overlapping tissue. This tissue may collect food and debris to form a pocket, and eventually cause loss of the tooth.

Use of the lancet is unsatisfactory in these operations for the following reasons: (1) the possibility of hemorrhage; (2) poor access to the tissue with either the straight or the curved blade; (3) the difficulty in removing the tissue low enough to get the proper results; and (4) the greater possibility of infection of the wound itself. The electrosurgical method obviates these objections. The technique is not difficult, but attention to pathologic and mechanical details is essential.

Technique—After proper anesthesia has been obtained, a loop electrode is used to remove the excess tissue to the desired depth. This may be done in several stages so that the proper contour can be preserved. The contour must be maintained far enough distally to assure proper healing inasmuch as epithelium will adhere only to cementum. The electrocoagulation incident to the operation seals the capillaries, controls hemorrhage, and results in a comparatively sterile wound.

I believe this technique to be better for removal of the third molar flap than those previously used (Figs. 1, 2, and 3). It overcomes the objections and difficulties of the cold knife method, and at the same time has the additional advantage of lessening the incidence of recurrence.

Hypertrophied Tissue and Growths

Electrosurgery is the ideal method for removing, in one operation, tissue which has proliferated into a cavity. This method eliminates hemorrhage, leaves a sterile wound, and does not take more than fifteen seconds of time.

The patient is placed in an electromagnetic field, and a thin straight wire electrode is inserted in the holder. A cutting and coagulating current is used to remove the excess tissue.

Utmost precaution must be taken in the removal of growths for biopsy. It is necessary that one use great care not to burn or destroy cells inasmuch as the pathologist would not then be able to make a diagnosis. All growths, no matter how innocent in appearance, should be sent routinely for microscopy, and a physician should be called for consultation. Other symptoms should be noted as this may save time and embarrassment later.

Case Report—A white man, aged 47, was first seen on September 18, 1941, at which time a complete dental prophylaxis was done. He was advised to have a small area of hypertrophied tissue in the lower anterior gingiva incised or removed. History revealed that it had been present for approximately a year, and that it was painful when he ate hard foods.

On February 22, 1943, the patient returned. The growth had become more than double its original size (Fig. 4), and had given him more concern. His physician reported him to be in excellent health, except for the neoplasm; he presented no other growths of any kind.

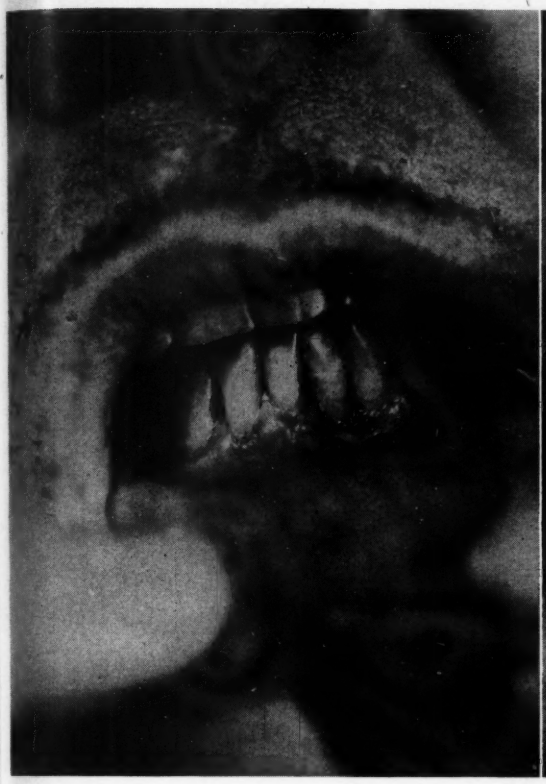

Fig. 5—Appearance of lower anterior gingiva immediately following removal of growth by electrosurgery.

Fig. 6—Area of lower gingiva one week after surgical treatment.

Fig. 7—Area one year after surgical treatment showing healthy tissue with no sign of recurrence.

Fig. 8—Preoperative roentgenogram of severe periodontitis of lower gingiva.

Fig. 9—Preoperative appearance of severe periodontitis.

Fig. 10—Lower anterior gingiva immediately after treatment of periodontitis with electrosurgery.

Fig. 11—Appearance of lower anterior gingiva one week after electrosurgical treatment of periodontitis.

Fig. 12—Appearance of lower anterior gum tissue one year after operation. Note the firm, clear, healthy tissue with normally contoured gingival crevice.

On February 25, 1943, the tissue was removed (Fig. 5) and was sent to the pathologist. A diagnosis of epithelioid papilloma was made. The area was coagulated, and the postoperative course was uneventful; the patient suffered no pain. Figure 6 shows the area one week after operation. Figure 7 shows it one year later; note the clear healthy tissue with no sign of recurrence of the growth.

Electrosurgical Treatment of Periodontal Disease

This article is not designed to enter into the controversy regarding results or indications for the surgical treatment of periodontitis, but merely to outline a technique of the electrosurgical approach. The original theory of using only electrocoagulation is now replaced by a technique whereby a current is used which places the patient in an electromagnetic field, thereby simplifying the procedure.

A cutting current is used to remove all the inflamed tissue within a millimeter of the depth of the periodontal pocket. The base of the pocket, including the root and the alveolar process, is smoothed by means of files and polishers. The remaining tissue is then coagulated lightly with a bipolar electrode, leaving a sealed wound. A 10 per cent solution of tannic acid is applied to the area of operation. Figures 8 through 12 show the preoperative and postoperative appearance of periodontal disease treated by electrosurgery.

The dangers of devitalization of tooth and bone are in direct proportion to the strength of the current, the time it is held in contact with the tissue, and the amount of resistance produced by the tissue. If these difficulties are overcome, an excellent result will be obtained.

The advantages of electrosurgery in treating periodontal disease are listed:

1. Access to posterior teeth is easier.
2. Small vessels are sealed, preventing hemorrhage.
3. No packs are necessary.
4. The chance of infection being carried by the blood stream is lessened, and postoperative infection of the wound is minimized.

602 *Medical Arts Building.*

Intermittent Burning of the Palate

Query

A woman, aged 32, the mother of two children, has complained for the last four years of an intermittent burning in the hard palate. The burning is bilateral and involves the anterior portion of the palate. The patient insists that at times small blisters and cracks appear, but I have never been able to identify them. Diet is adequate, and careful blood study has not revealed any abnormalities. There has been no response to treatment with adequate amounts of vitamin B complex and multivitamin preparations. The complaint began following a cervical amputation for severe erosion and laceration. Preceding the operation the patient complained of numbness and tingling in the fingers, which cleared up following the operation. The patient otherwise is neurotic and of poor emotional control. When situations arise which provoke emotional response on her part, the burning in the mouth becomes worse. She refuses, however, to accept the idea of psychogenicity or to permit psychotherapy. The burning is somewhat relieved by application of topical anesthesia. An oral surgeon has advocated alcohol injections of the palatine nerves.

Although it is probable that the patient's complaint is largely hysterical in nature, in view of the relief with topical anesthesia and the rejection of a more fundamental approach by psychotherapy, do you think alcohol injection may prove beneficial? Are any harmful sequelae likely to ensue?

Answer

Does the patient have any trigger zones in the tonsillar regions? Has she free acid in her stomach contents? From the description, the patient is afflicted not with a neuralgia but with a neurosis. It is doubtful that an injection of alcohol into the foramen rotundum or into the gasserian ganglion would have an anesthetizing effect. Although the palatine nerves are branches of the maxillary division of the trigeminal nerves, they are supposedly related to the seventh and ninth cranial nerves. In this case the pain is bilateral, and both sides would have to be injected. Harmful sequelae are not likely to ensue.

It must be borne in mind that if this patient is neurotic and does get a permanent anesthesia, she may be quite disturbed about the numbness. The topical applications might be continued. If the burning becomes uncontrollable, one side may be injected. Before it is done, however, the patient should be fully acquainted with the probable resultant numbness of the palate.

—From Queries and Minor Notes, *J.A.M.A.*, 126:62 (September 2) 1944.

Aviation Dentistry: Effects of High Altitude Flying

(PART II)

D. V. SUMMERVILLE, D.D.S., Buffalo, New York*

DIGEST

Last month, the basic atmospheric, physiologic, and chemical conditions present in high altitude flying, and the body responses to these conditions, were reviewed. In this continuation of the article on aviation dentistry, the dental discomforts, many of which are manifestations of other physiologic discomforts associated with altitude flying, are discussed.

Anoxia

WITHOUT oxygen, the average person can carry on efficiently for only the following lengths of time at the indicated altitudes:

1. 35,000 feet for about 35 seconds.
2. 25,000 feet for about 5 minutes.
3. 20,000 feet for about 10 to 15 minutes.
4. 18,000 feet for about 45 to 75 minutes.
5. 15,000 feet for about 5 to 6 hours.
6. 10,000 feet all day. (Symptoms of chronic lack of oxygen will be present if repeated daily.)

It has been stated that the brain and the nervous system use high percentages of oxygen; therefore, even a small decrease in oxygen content in these parts will predispose to early symptoms of anoxia and will result in a decrease in function (Fig. 1). Other parts of the body are affected, particularly the heart muscle and, as a tissue, the blood. The rate, amount, and extent of change of physiologic function are dependent on the following factors:

1. Rate of Ascent: A rapid climb will sometimes produce a condition similar to asphyxia (it is not true asphyxia), and unconsciousness may result in from forty-five seconds to ninety seconds.

2. Maximum Altitude: The higher the altitude, the less the pressure and available oxygen.

3. Duration of Flight: Long subjections to decreased pressure and lack of oxygen result in more profound symptoms of anoxia.

4. Frequency of Flights: On many missions which are successively conducted over a period of time at a given altitude, and which result in any decrease of oxygen in the blood, a gradual mental and nervous impairment will result.

It is to be expected that a pilot of excellent physique and training, just as a mountain climber, can better withstand the effects of anoxia and is able to attain a higher altitude than one who is not trained nor in excellent physical condition.

The subjective symptoms of anoxia are:

1. Euphoria, a sense of well-being; unawareness of the progressive effects of anoxia.
2. A compensatory increase in depth and in rate of respirations.
3. Poor judgment, with mental and physical impairment.
4. Dizziness.
5. Unconsciousness.
6. Headache and fatigue on recovery of consciousness.

There is little evidence to support the belief that anoxia has any specific deleterious effect on the vascular tissue within the pulp chamber of a

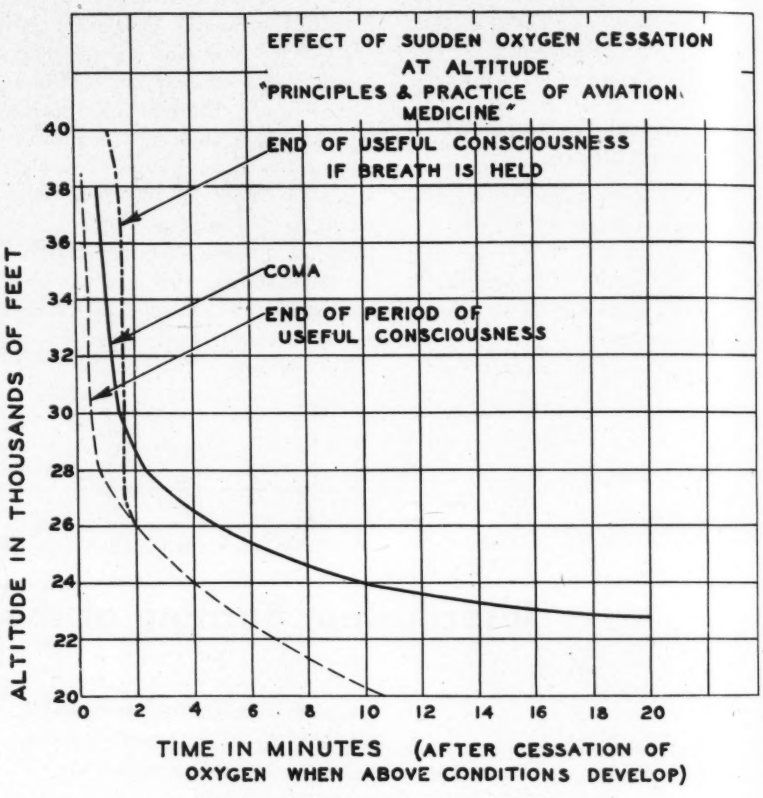

Fig. 1—Altitude-useful consciousness chart.

*From Curtiss-Wright Corporation, Airplane Division, Research Laboratory.

normal tooth when considered in the light of impairment to the system as a whole.

The reduction of arterial tension of oxygen is more serious than is the lack of oxygen saturation. The low carbon dioxide pressure slows the dissociation of oxyhemoglobin. There is evidence to show that a rapid increase in the red blood cells takes place during anoxia.

Aeroembolism

Aeroembolism, commonly referred to as "decompression sickness" or "bends," is a condition produced within the body when it is exposed to decreased atmospheric pressure. It is characterized by the formation of gas bubbles within the tissues of the blood. The bubbles are formed of nitrogen, oxygen, carbon dioxide, and water vapor, with nitrogen being the quantitative factor.

Inasmuch as diffusion of gases in the blood is dependent on pressure and density, this principle can be compared with that of bottled carbonated drinks. When the cap is removed from a bottle of carbonated liquid, visible gas bubbles escape. This is the result of a greater concentration of gas under pressure within the liquid than in the outside air; the atmospheric air is less dense, thus exerting a lesser pressure. At high altitudes, the external body pressure is reduced in ratio to the internal body pressure; therefore, the blood gives up part of its contained gases to form small nitrogenous bubbles, which in turn unite to form larger bubbles. These bubbles are formed from gases by the expediency of moving from an area of greater concentration to one of lesser concentration as dictated by the related internal and external pressures.

Fatty tissues of the body are able to concentrate or dissolve five to six times as much nitrogen as the blood, the amount of both depending on the partial pressure of nitrogen in the air.

Nitrogen is eliminated by the lungs. It is inert and does not enter into any particular physiologic function. A gradual climb to high altitude with decreasing atmospheric pressure involves a gradual elimination of nitrogen. A rapid climb usually results in nitrogen coming out of solution from the blood and circulating as bubbles until it can be eliminated by the lungs. These bubbles find various areas for lodging, such as joints and restricted circulatory areas. The high percentage of nitrogen in fatty tissues serves to isolate it in these tissues.

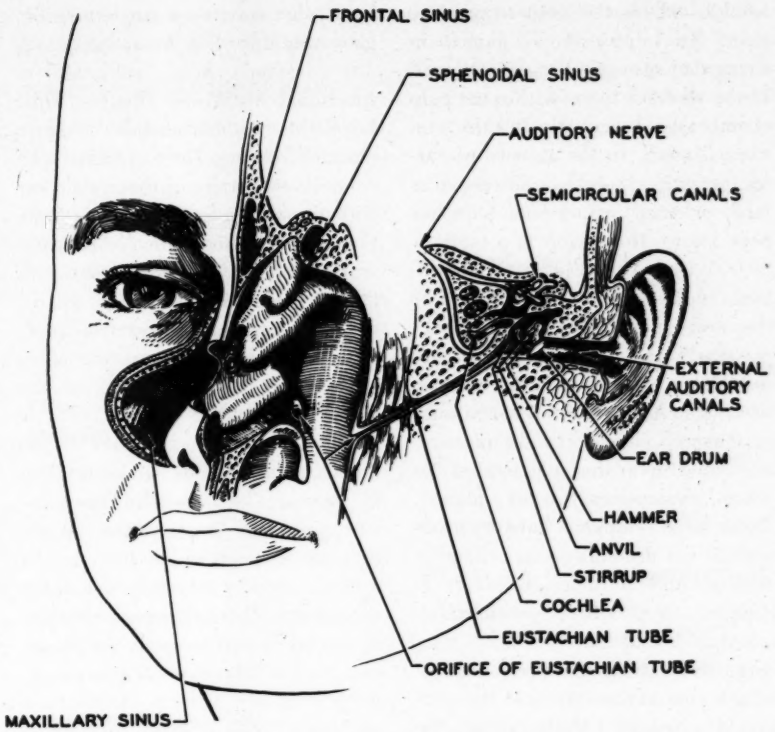

Fig. 2—Relationship of nasal sinuses, middle ear, and nasal cavity.

Aeroembolism seldom develops in a normal, healthy person below 30,000 feet regardless of rate of climb, but variations in susceptibility occur in different persons. It is averaged by the Mayo Aero-Medical Research Unit[4] that about one out of six persons will develop aeroembolism above 30,000 feet. The time factor for this development likewise varies with different persons.

Severity of symptoms may indicate the degree of embolism produced. Pain about the joints, usually the larger ones, is an early indicative symptom; radiation of pain from these areas is not uncommon. Muscular cramplike pains are often indicated, especially among those tissues which have a high fat content.

Aeroembolism produces a condition in the lungs called "chokes." It is thought to be caused by small nitrogen bubbles choking, or blocking, some of the minute capillaries that enmesh the air sacs. The pain ranges from a burning sensation to a cutting pain. Discomfort is increased by a desire to cough, an act which does not alleviate the condition. Suffocation symptoms are evidenced as breathing becomes shallower; cyanosis is prevalent.

Various subcutaneous skin irritations are often manifested and are usually the result of nitrogen bubbles causing disturbances to the central nervous system. Edema may result from progressive onset of the occurrence, and may last for a short period of time.

Aeroembolism and the Teeth

One must be constrained when presenting evidence that aeroembolism

[4]Halbouty, M. R., and Resch, J. A.: Flight Prophylaxis: Lecture and Demonstration Outline, Auspices of Mayo Aero-Medical Unit, W. M. Boothby, Chairman, 1942.

actually affects the teeth to produce pain. An impression is gained in flying that aeroembolism is evidenced in the vascular tissue within the pulp chamber of a perfectly healthy and normal tooth. In the absence of caries, gingival absorption, abscesses, or large or small restorations, pain has been known to develop in a tooth at 30,000 feet. The severity is contingent, supposedly, on the progress of the aeroembolism. A natural supposition is that nitrogen bubbles are formed or carried within the vascular tissue and, because of the inflexibility of the pulp chamber walls, pressure is exerted upon the pulp tissues. No other explanation seems logical. These same symptoms have been observed in decompression chamber runs to high altitudes. Recovery is complete. It is entirely possible that odontitis could be evidenced if a form of contusion existed, because of a temporary isolation of the contained nitrogen bubble within the pulp chamber on ascent to a higher altitude.

Inasmuch as aeroembolism is a direct result of dissociation of gases within the blood at high altitudes where atmospheric pressure is reduced three and one-half or more times, the counteracting measure is to return to a lower altitude. An increase in atmospheric pressure would result, and the nitrogen bubbles would not only continue to be eliminated through the lungs but would re-enter into solution in the blood, thus effecting a balance.

The normal procedure for prevention of aeroembolism is accomplished by replacing the partial pressure of nitrogen with oxygen. Breathing pure oxygen from the ground up results in no further entrance of nitrogen into the blood, and a reduction of the nitrogen content of the blood to a low minimum by elimination through the lungs.

Ear Conditions

The ear presents many problems for the airman before, during, and after flights. A proper knowledge of the care of the ears may keep a pilot protected for years. An inadequate knowledge may, on a single mission, ground him for life. An airman's ears are constantly being subjected to functional disturbing changes while in flight, as barometric pressure changes indicate. The eustachian tube connects the cavity of the middle ear with the atmospheric air, thus functioning to balance the air pressure within the middle ear cavity with that of the atmosphere (Fig. 2).

During ascent, barometric pressure decreases; therefore, any effective change in pressure is from the middle ear to the outside. This is manifested by an expansion of the air within the middle ear cavity with an increase in pressure. This pressure, in turn, forces contained air through the eustachian tube to the outside, thereby effecting a balance of pressure. This balancing procedure is carried on involuntarily during ascent and is of no particular consequence to the airman. At times a clicking of the ear drum indicates a reduction in air pressure.

The descent from an area of decreased pressure to one of increased pressure is of particular significance to the airman, inasmuch as the reverse in pressure-balancing is necessary between the air of the middle ear and the atmospheric air. During descent from high altitudes, it is necessary for atmospheric air to enter the eustachian tube for balancing of pressure within the middle ear. Many conditions arise to present difficulties for this balancing procedure. The orifice of the eustachian tube in the throat is a closed slit except when caused to function by the dilator muscles. If this orifice does not function properly, the increase in atmospheric pressure will force the tympanic membrane inward under pressure, thereby causing pain and possibly a rupture of the ear drum. This condition may be alleviated by swallowing, by chewing of mints or gum, or, as a final measure, by blowing the nose. Some pilots protrude the lower jaw as in stifling a yawn, thereby opening the orifice of the eustachian tube. Conditions which arise to prevent a normal functioning of the eustachian tube for equalization of pressures may be effected by:

1. Varying degrees of sinusitis.
2. Nasal obstructions.
3. Loss of posterior teeth.
4. Abrasion of teeth.
5. Malocclusion.
6. Retrusion of the mandible.
7. Tonsillitis.
8. Lack of proper training for the control of this condition.

The question of overclosure of the mandible versus balanced occlusion has been well exemplified in the work of Willhelmy.[5] No doubt exists as to the value of his findings when applied to loss of applied muscular tension. Cases were reported[6] wherein "pilots suffered ear pain and dizziness on sudden loss of altitude. Each of these pilots was entirely relieved of the symptoms after repositioning the mandible, thereby increasing the vertical dimension and presumably relieving the compressing of the eustachian tubes." It has been noted that when a shrinkage of the meniscus pad exists, there likewise exists an increased difficulty in equalizing the involved pressure.

Pressure Changes and the Sinuses

If the natural openings of the frontal, maxillary, ethmoidal, and sphenoidal sinuses are obstructed, the sinuses are subjected to inequalization of pressures comparable to that of the middle ear (Fig. 2). There is usually pain in the affected area. The natural openings of these sinuses may be affected by sinus infection, rhinitis, coryza, nasal obstructions, and other conditions. Normally, during ascent or descent in high altitudes, the sinuses function with impunity, the natural openings of each sinus affording a constant equalization of pressure.

It has been noted that many pursuit pilots are afflicted with a mild form of rhinitis which results in a mild nasal discharge of a watery mucous secretion. It may be that the pursuit cockpit is responsible for this

[5]Willhelmy, G. E.: Relationship of Overclosure of Mandible to Ear Pains While Flying, THE DENTAL DIGEST, 47:544 (December) 1941.
[6]Willhelmy, G. E.: Aerodontia, THE DENTAL DIGEST, 49:311 (July) 1943.

condition inasmuch as the air is often hot, stuffy, and contaminated with oil fumes which affect the nasal mucous membrane if not the continuity into the various sinus areas. Pilots generally find that breathing pure dry oxygen in a condition of this kind is beneficial.

Expansion of Gases Within the Body

The stomach and the large and small intestines normally contain various quantities of gases which are subjected to changes in barometric pressure, as manifested by Boyle's Law. An increase in altitude will increase abdominal pressure through expansion of the contained gases. The abdominal content of flatus is composed of a variety of gases, the highest percentage being nitrogen. At 20,000 feet, the ratio of gas expansion within the abdomen to outside atmospheric air is about 2.4; at 40,000 feet, the ratio is about 7.6. Any marked degree of abdominal distension will cause discomfort. Cramps, breathing difficulties, and interference with heart action, may result in more severe cases.

Remedial action is by the natural expulsion of flatus. If unable to control by these means, it is necessary to descend to a lower altitude where atmospheric pressure is increased, thus alleviating the distension. Gas-forming foods should be omitted from the diet twelve hours to twenty-four hours previous to flight, or should be eliminated entirely if flying at high altitudes is a regular occurrence. A few of the gas-forming foods and drinks are cabbage, peas, beans, beer, and carbonated drinks.

Effect of Drugs at Altitude

Many drugs, such as sedatives, headache powders, and sulfonamides, are responsible for lowering the "service ceiling" of airmen, and often make them unfit for flying duty. Excessive use of alcohol or tobacco is not conducive to high altitude flying, and should be omitted if flight is continuous.

Effect of Oxygen on Dental Structures

There is a belief that the use of oxygen during flight is harmful to tooth structure and dental restorations. This is a fallacy; the teeth show no deleterious effects. Neither is it injurious to lung tissue to breathe pure dry oxygen for a number of hours at any one time.

Intra-Oral Infection

The effects of various infections (apical abscesses, osteomyelitis, and Vincent's angina) on the human body are well known. Lowered resistance and lowered general effectiveness (fatigue) are expected. Any oral infection, suppurative or otherwise, will lower resistance and reduce the close coordination required between mind and body. A general systemic toxic condition will lower the service ceiling greatly for a pilot, not only from general debility but often from pain produced at high altitude. The safety factor for the pilot is reduced likewise.

The roentgenogram does not always expose an area of apical rarefaction if it is mild in character. At high altitudes, a severe pain may result from such an area as the result of gas expansion with a decrease in atmospheric pressure. The pain usually subsides upon descent to altitudes of increased pressure.

Effect of Caries

Caries at high altitudes where changes in temperature are indicated predispose to odontalgia. Whether or not lowered atmospheric pressure at high altitudes is a causative factor is not ascertained. I know, however, of cases in which carious teeth did ache during a decompression chamber run to 35,000 feet without refrigeration.

Effects on Dental Restorations

Many cases are known in which dental restorations, usually amalgams, acted as conductors of thermal changes at high altitudes, thereby causing considerable pain. A preventive procedure is to make a new restoration with a nonconductor base such as cement.

Comments

A knowledge of the atmosphere and its phenomena is essential for an understanding of the problems arising in aviation dentistry. The dental profession can do much for those who fly, or will fly. We must exert every effort to increase safety, alleviate pain, reduce toxic conditions, increase altitude performance, aid vision and fatigue factors, and contribute in general to the future progress of aviation.

We Can't Pay You, But—

No DENTAL author can ever be *paid* for a valuable technical or scientific article. The value of such material is above a monetary basis. In the preparation of a technical article, however, an author often expends money for drawings, photographs, models, or graphs. We would like to help defray some of these expenses.

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About 20,000 of our dental colleagues are in military service. Few of them will have the time, the facilities, or the opportunities to develop new techniques or to write for the dental literature. They will be eager, however, to read of the new developments in dental science and art.

Writing articles for publication in technical journals can be a contribution to the war effort, because that is how to help our dental officers in the Army and Navy keep abreast of technical advancements, and it is one way to improve the skill and services of civilian dentists on the home front.

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We hope that you will accept this invitation!

Clinical and Laboratory Suggestions

Fig. 1

A Method of Preventing Fracture of Marginal Ridges of Compound Amalgam Restorations

Submitted by Lieutenant (jg) T. J. Hanson (DC), USNR, San Francisco[1]

Fig. 1—In removing the matrix after placing a two-surface amalgam restoration, hold a wet round pledget of cotton at the marginal ridge of the restoration. If three surfaces of the tooth have been restored, the cotton should cover the entire occlusal surface while the matrix is being removed.

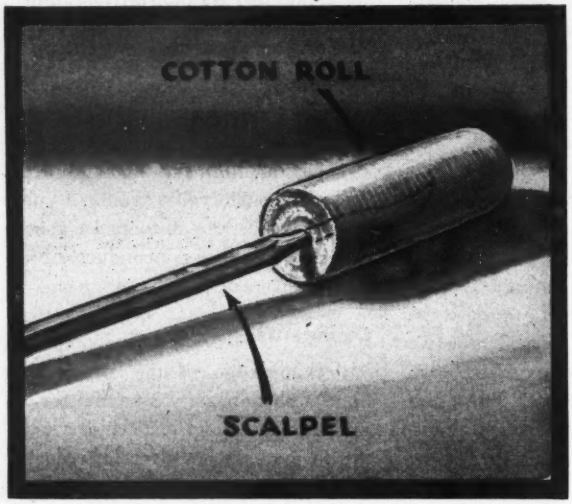

Fig. 2

A Method of Keeping Instruments Sharp

Submitted by Miss Ermina Miller, Springfield, Massachusetts

Fig. 2—After sharpening instruments, insert them in cotton rolls before placing them in the sterilizer. This will keep the instruments from becoming dull.

The Use of Copper Tubes in the Direct Method of Acrylic Jacket Construction

Submitted by Robert Cutler, L.D.S., London, England

Fig. 3—Adapt a copper tube filled with inlay wax over the jacket preparation to make a clear wax registration of the gingival shoulder. Squeezing the tube before the wax has hardened provides a rough contour of the tooth form in wax. Slit the band to the root margin end with a stone after the wax has cooled, and remove the band. Develop the rough wax outline of the preparation, producing more anatomical detail.

[1]The opinions or assertions contained herein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

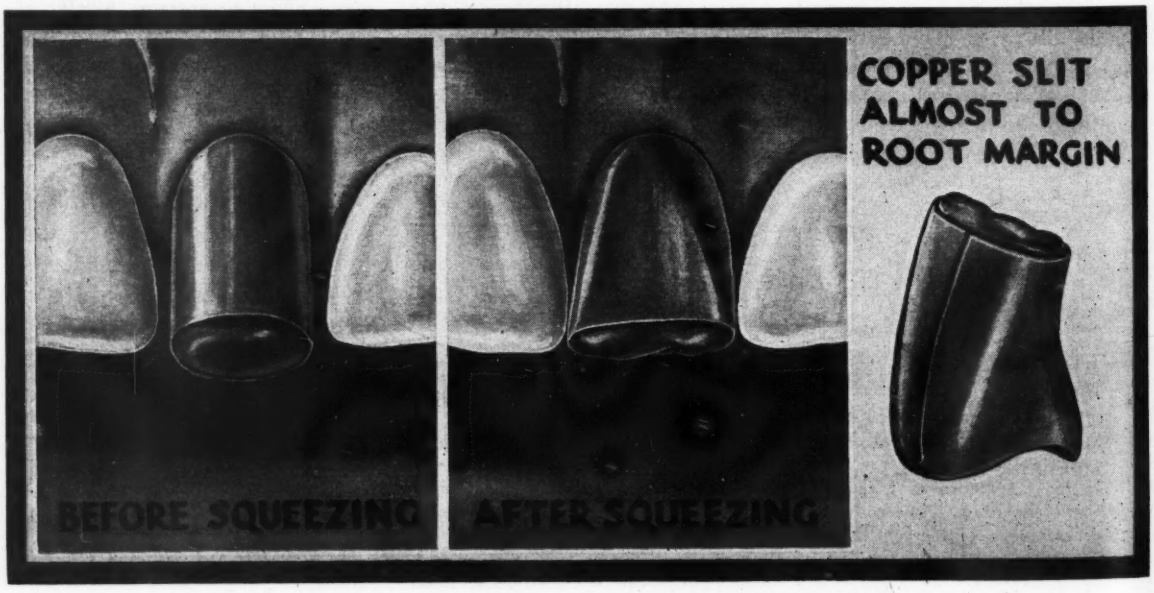

Fig. 3

The Use of Yellow Laundry Soap as a Separating Medium

Submitted by F. W. Allen, D.M.D., Boston

Fig. 4—Place a fourth or a third of a cake of yellow laundry soap (I use Fels-Naptha) into a water glass, and apply a generous lather of the soap to the impression with a small paint brush. Wash off all bubbles with running water and apply a second coat of the soap.

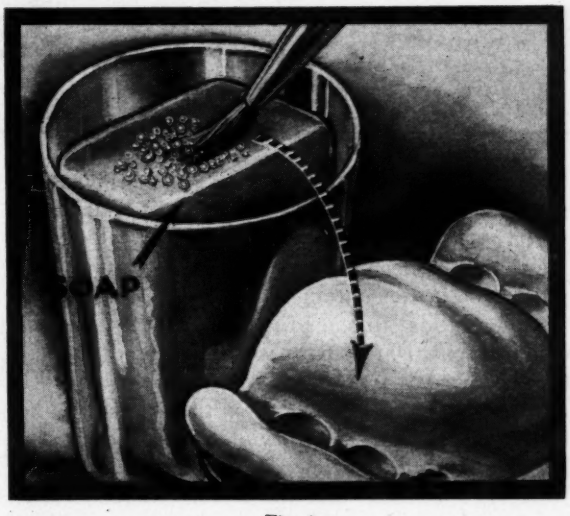

Fig. 4

The Use of a Discarded Saliva Ejector as an Aspirator for Oral Surgical Procedures

Submitted by Abraham Glick, D.D.S., Chillicothe, Ohio

Fig. 5—Cut the saliva ejector along the dotted line with a Joe Dandy disc, round off the sharp edges, and polish with rubber sulci discs. The aperture may be enlarged with a crosscut fissure bur if necessary.

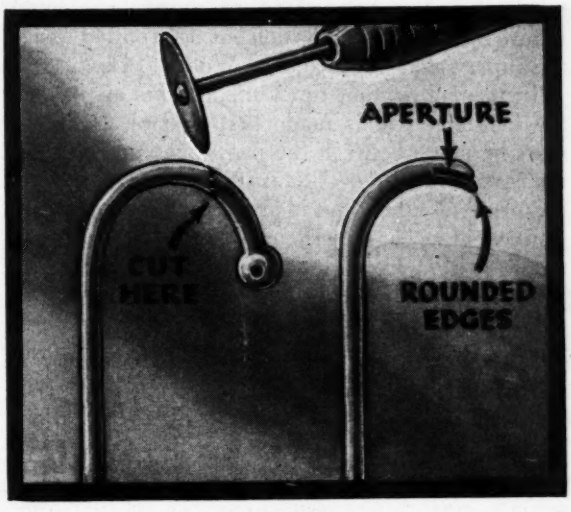

Fig. 5

A Technique for Preventing Acrylic from Falling Out of Cast Gold Veneer Crowns

Submitted by I. F. Miller, D.D.S., Pittsburgh

Fig. 6—A retainer made in the face of the gold crown to pass through the acrylic will prevent the acrylic from falling out of the crown.

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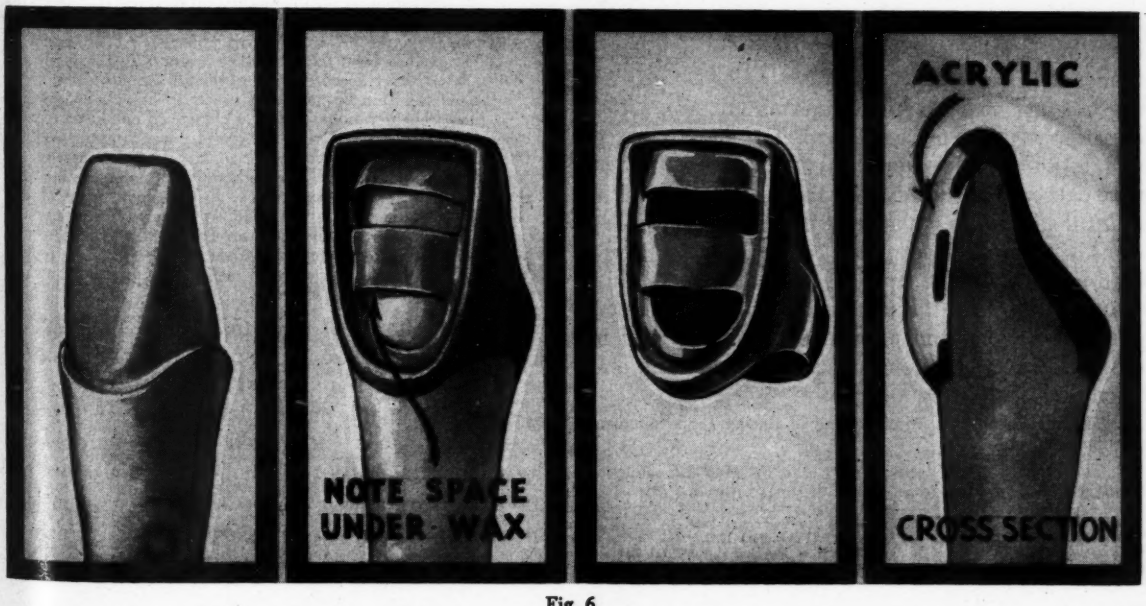

Fig. 6

The Editor's Page

PAIN IN THE human body may be produced by a variety of sensory stimuli: chemical, electrical, thermal, and mechanical. A dentist is familiar with all these. He encounters examples of each kind of stimulus in his clinical practice. An understanding of the mechanism of pain is important to the dentist who wishes to prevent, control, and treat the reactions to pain. Two books on the subject should be in the library of every dentist: One by Sir Thomas Lewis[1] (reviewed in this magazine in November 1942);[2] and the recent publication of the Association for Research in Nervous and Mental Disease,[3] a symposium of papers presented before the Association, which has been edited under the supervision of Harold G. Wolff, M.D.

In the publication by Wolff and his associates, the insistent note is made that a clear definition must be made between the *perception of pain* and the *reaction to pain*. The threshold of perception is uniformly constant and is probably a constitutional component as characteristic as the pulse rate or the number of white blood cells. The perception threshold does not vary because of age, sex, or emotional and fatigue states. The reactions to pain, however, are varied, bizarre, and unpredictable. Reactions vary widely from person to person, and in the same person from time to time. Wolff describes the reactions thus:

> The reaction pattern of the organism to the sensation of pain usually follows promptly the perception of pain. . . . The reaction pattern is, however, independent of perception and may be dissociated from it. It may, however, be modified or even obliterated.

This reaction pattern, which is set off commonly by pain, may be set off frequently by a completely innocuous stimulus. Such a reaction can be called an "alarm" reaction, inasmuch as the immediate situation of a person as regards fatigue, anxieties, and attitudes, together with his past experience, may cause the same reaction to an apparently nonpainful stimulus as to a painful stimulus. He shows signs of agony, apprehension, and intolerance, of a kind not explainable by the degree of the stimulus.

In contrast are the instances of dissociation of pain perception from pain reaction as observed in the following situations described by Wolff and Goodell:

1. The indifference to injury sustained during the excitement of games or combat.

2. The absence of reactions to pain when, during the influence of suggestion, hypnosis, or catalepsy, tissue is injured.

3. The apathy or "quietism" that accompanies tissue damage during autosuggestion and during religious and mystical practices.

4. The indifference to tissue damage during sexual excitement.

5. The indifference to pain often witnessed during parturition in women who are confident in their physician and desirous of bearing a child.

Thus, the success or failure in the therapy of pain may be influenced markedly by the attitude engendered in the patient. Confidence, feeling of security, and the conviction of being helped, on the one hand, and anxiety and lack of confidence on the other, may determine whether or not a therapeutic procedure or an analgesic will be useful.

In one of the presentations in the symposium, Simons and his associates demonstrate that muscle tensions in the scalp and neck muscles give rise to painful sensations in the shoulders, neck, and head. The following questions, of which the investigators make no mention, arise: If sustained contraction of the muscles of the scalp and neck produce pain in the head, what possible effects might be produced by the sustained contraction of the muscles of mastication due to nervous habits? Is it possible that idiopathic facial pains, including those involving the dental structures, might have their origin in the tensions and spasms of the muscles of mastication?

Dentists are concerned in their workaday world with the behavior of analgesic agents. On this subject Cattell presents the following point of view:[3]

> The evidence just cited, regarding the variable sensory experience produced by a painful stimulus depending upon the mental state of the individual, is of obvious importance in relation to the relief of pain by drugs. An agent which improves the mood or removes anxiety should be an effective analgesic. This aspect of analgesic action has been recognized by workers in the field, and the concept generally accepted that although the subject may be fully aware of the pain he no longer reacts to it. . . . It seems to me that these considerations call for a change in emphasis regarding the mechanism of action of analgesic drugs. It may well be that the threshold-raising effect is secondary to influences on the mental state of the subject, who otherwise is likely to be preoccupied with the painful experience. Just as environmental distractions cause a rise in pain threshold, so do mood changes or the interference with mental processes through drug action. The rise in threshold which may accompany analgesia must then be looked upon as incidental to the changes in mental function, with awareness of pain not necessarily altered.

It is regrettable that in this excellent book on pain, there is no discussion of dental pain, one of the most common and most severe reactions experienced by man. The dental structures have always been in the "forgotten land"—ignored by physicians generally, and not integrated with the rest of the organism in the thinking of dentists. Once again we must emphasize the importance of organismal unity and totality.

[1] Lewis, Thomas: Pain, New York, The MacMillan Company, 1942.
[2] The Editor's Page, THE DENTAL DIGEST, 48:521 (November) 1942.
[3] Pain: Proceedings of Association for Research in Nervous and Mental Disease, December 1942, Baltimore, The Williams and Wilkins Company, 1943.

Merits of Acrylic: A Technique for Its Use in Bridge Construction

IRVING E. LABY, D.D.S., Beverly Hills, California

DIGEST

The advantages of acrylic over porcelain are presented, as are the precautions to be observed in the use of acrylic in bridges and jacket crowns. A technique for the construction of an acrylic anterior bridge is likewise described. A suggestion is offered to prevent dislodging of an acrylic crown after it is cemented in place: Retentive cups ground proximally inside the crown will provide wedges for cementing the crown to place.

PLASTIC MATERIALS have certain qualities and characteristics with which one must be thoroughly familiar in order to get the desired results. Acrylics must be precisely and carefully handled if constant satisfactory results are to be obtained. Acrylic resins in their present state cannot and will not replace all the other materials in dentistry, but when they are used where indicated and practicable, even the most skeptical operator cannot help but acknowledge their merits.

Advantages

1. Acrylic, because of its resilience, will not fracture as easily as porcelain. I have removed plastic bridges from abutment teeth by the use of a reverse mallet without fracturing or harming the bridges in any way. I have likewise used a mallet to drive an acrylic jacket or bridge to place in cementing. This is not possible with porcelain.

2. Acrylic has attritional value which, I believe, is due to its water absorption, 5 per cent by volume. The water acts as a lubricant to the surface of the acrylic, a characteristic which explains why this comparatively elastic material does not wear down as rapidly in occlusion as one would expect. I have had patients return months after insertion of an acrylic restoration to find a high spot which had not worn down and had to be ground.

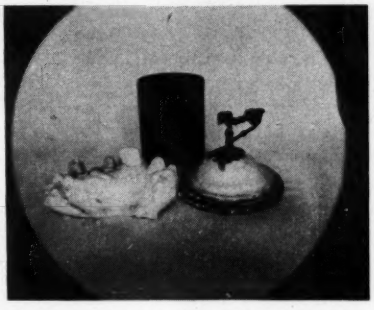

Fig. 1—Model (die) showing preparation for abutments upon which wax pattern is made, sprued, invested, and cast in one piece.

Fig. 2—Take solvite impression with impression bands in place on abutment teeth. Bands will come out with the impression.

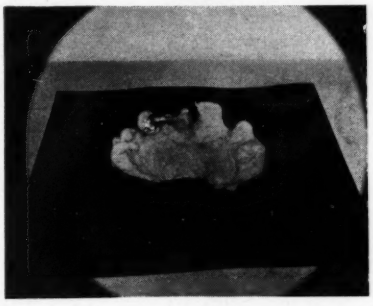

Fig. 3—Casting placed on die (lingual aspect).

3. The color shade of acrylic can be blended so as to defy detection in the mouth. Much of this is due to its property of light refraction comparable to that of natural teeth.

4. Another favorable characteristic of acrylic is that it can be manipulated with ease. It can be processed and made with simple equipment.

5. The chemistry of acrylic is such that polymerization takes place when heat is applied, which might give the impression that it is extremely injurious to the tissues if curing is not thoroughly completed. This, I believe, is an entirely erroneous and unnecessary apprehension. I am satisfied that acrylic continues to cure while in the mouth. I believe that this is proved in that a new bridge is much easier to cut or grind than is one which has been in the mouth for several months. The surface tension of the restoration increases while it is in the mouth. I have likewise observed that in patients with gingival irritation, the tissue around the acrylic restoration was usually in a healthy state, thus showing the tissue tolerance of acrylic.

Precautions

It is important to make certain that the methylmethacrylate is unadulterated by plasticizers and other impurities if best and constant results are to be obtained. Only coloring pigments should be added to the methylmethacrylate.

I have found, in a few cases, a seepage or discoloration around the abutments of a bridge, but no discoloration on the pontics. This, of course, is because there is never a true union between the gold and the plastic where the plastic is veneered over the thimble abutment. Seepage, therefore, causes the discoloration, which I have endeavored to eliminate in my technique.

It is essential, likewise, to use a

cement that will retain its original color shade. If the cement becomes dark beneath the jacket crown, the acrylic will appear to be discolored.

It is important, particularly in a large plastic bridge, to use a heavy gold reinforcement, or a reinforcement of an alloy that will not give or bend under stress. The bars connecting the abutments should be rounded so as to prevent cracking of the acrylic within the bridge. The engineering principles used in constructing bridges over rivers should be studied and applied here to rule out all stress and strain. If the metal support to the bridge were to give under stress, it would cause the brittle, cured plastic to crack. An internal strain set up by the acrylic would not be relieved if the gold skeleton were rigid and held fast to the acrylic.

Technique for Construction of an Anterior Bridge

1. Prepare the central incisor for a jacket crown in the conventional manner, exaggerating the preparation where pulp permits, thus making thickness of the abutment crown possible.

2. Prepare the right cuspid abutment for a lingual plate with three-dowel anchorage for retention (Fig. 1). These pins, or dowels, should be made with a crosscut fissure bur and should be kept as far proximally as possible. The lingual pin should be kept as far as possible to the periphery lingually to prevent encroachment on the pulp.

3. Fit and contour a copper band to the abutment teeth, and bend the copper band at the open end so as to facilitate removal with the impression.

4. Use compound, colloid, or wax for the impression material, depending on the die desired. With the impression bands in place on the teeth (Fig. 2), take a solvite impression; the bands will come out with the impression.

5. Pack amalgam into the tube impressions and pour the remainder of the impression in stone (Fig. 1). The entire bridge can be constructed from this hard, accurate model without the necessity of inserting it in the mouth until it is ready to be cemented in place.

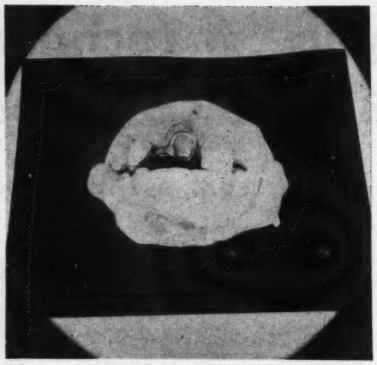

Fig. 4—Window cut through gold casting on central converts the coping into a three-quarter casting.

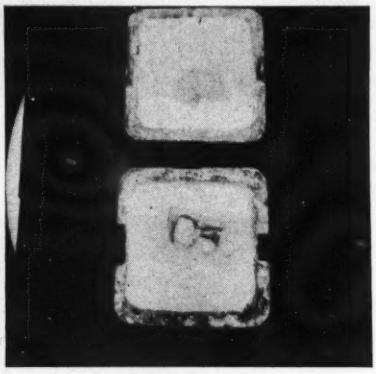

Fig. 5—Pattern invested in lower half of flask with labial and incisal exposed. The wax is boiled out ready for packing.

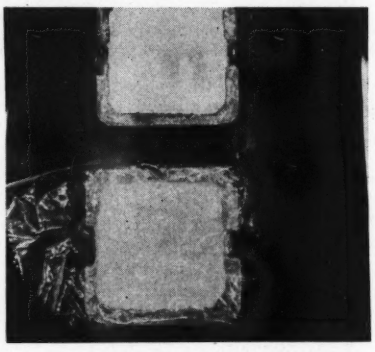

Fig. 6—Wet cellophane on lower half of flask before placing flask into press.

6. Lubricate the die to facilitate removal of the wax pattern, which is carved, sprued, and invested to the cast in one piece (Fig. 1).

7. Place the casting on the die (Fig. 3). If desired, a window can be cut through the gold casting on the central, converting this coping into a three-quarter casting. The reason for this is apparent in Figure 4.

8. Carve the wax pattern over the skeleton in light or ivory-colored wax, and remove from the model. (Do not use blue wax; it will stain the model.)

9. Place the wax model into the lower half of the flask which has been filled with stone. Be careful to invest so that the labial and incisal (or occlusal) are exposed (Fig. 5).

10. Paint the model with tincture of green soap (the separating medium), and wipe the excess off with a cloth.

11. Place the upper half of the flask and pour in stone. To facilitate removal, the plaster and stone can be mixed in proportions of 50 per cent.

12. When the plaster is hard, separate the flask and remove the wax by pouring boiling water over the pattern. Blow out the excess water and saturate with Film-ac or a similar separating material, which takes the place of tin foil and allows plaster to come away from acrylic easily, leaving a smooth surface. Allow a half-minute to elapse before blowing out the excess Film-ac.

13. Mix the polymer and monomer of the methylmethacrylate in the proportions of about one of the monomer (liquid) to three of the polymer (powder). Add the liquid to the powder with an eye-dropper, drop by drop, until the saturation point has been reached. Place a cover on the jar, and allow it to stand until the mix has become tacky in consistency. Spatulate, or knead, the tacky mix until it is of a doughy consistency.

14. Wet the fingers and pack the mix into a mold, slightly to an excess. Place wet cellophane over this (Fig. 6), and clamp the other half of the flask to place with slow pressure (Fig. 7). Loosen the press, and open the flask. Remove the cellophane, trim the excess plastic away, and replace the wet cellophane. Close the flask, and put it into the press (or clamp). Place the press in a pan of

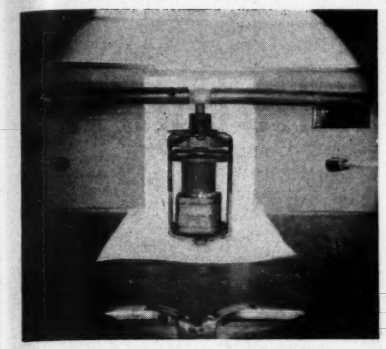

Fig. 7—Flask in press.

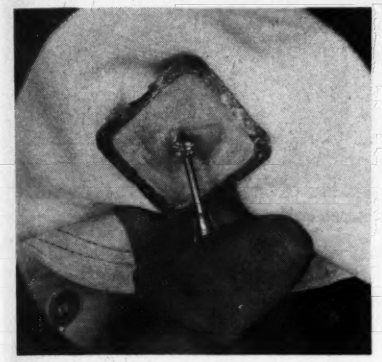

Fig. 8—Using a vulcanite bur, trim incisal third of tooth to 45-degree angle, equivalent to amount of translucent acrylic to be applied.

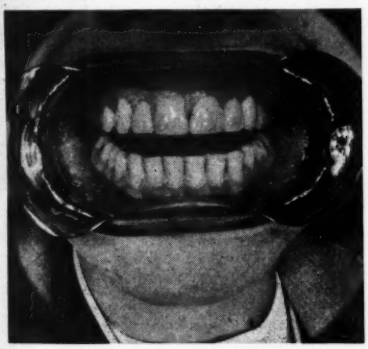

Fig. 9—Finished acrylic bridge in place.

water over a low flame so that the water will heat slowly. Maintain the water at a temperature below boiling for one hour or longer; *do not boil.*

15. At any time after one hour, remove the press from the water and open the flask. Remove the cellophane, handling the hot flask in a towel. Trim the incisal third of the tooth to a 45-degree angle, and the cusps of bicuspids and molars equivalent to the amount of translucent acrylic to be applied (Fig. 8), using a diamond stone or a vulcanite bur.

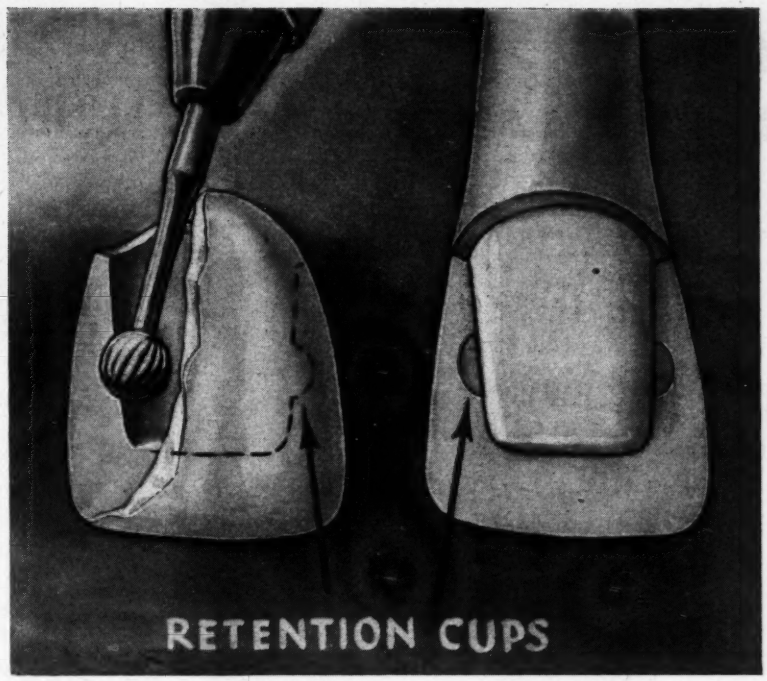

Fig. 10—Retentive cups made on proximal sides inside of acrylic crown provide a wedge when cementing crown in place over tooth preparation.

16. Mix the translucent acrylic monomer and polymer to the point of saturation, as with opaque, or body, acrylic except that it is packed on the incisal and occlusal without waiting for the mix to become tacky. Pack and cover with wet cellophane; close the flask, press, and place it back in hot water, continuing the temperature below boiling for one-half hour or more. Then allow the water to boil for one-half hour, after which allow the flask to remain in the water to cool gradually. *Do not remove the flask from the water until thoroughly cooled.* The opaque acrylic must be hardened in this manner before trimming is done because when translucent acrylic is added to the soft opaque, it will impregnate it, causing the opaque to become less opaque or diluting it so that the gold will show through or discolor it. If the foregoing procedure is used, even a thin veneer of opaque over the gold coping will not show through.

17. Open the flask when cool, and carefully dig out the bridge. Trim and polish, using a slow buffer with rouge, whiting, or fine pumice. Extreme care should be exercised until the "feel" for polishing acrylic is acquired. Place the bridge on the model for detail finishing. Acrylic restorations must be kept in water until just prior to cementing.

Figure 9 shows the finished acrylic bridge in place in the patient's mouth. The right cuspid was brought into alinement when it was used as an abutment for the bridge, and the upper left lateral was replaced.

Retentive Cups for Acrylic Jacket Crowns

The tooth is prepared for an acrylic crown in the same manner as for a porcelain jacket crown except that two retentive cups are made on the proximal sides inside the acrylic crown with a half-round bur (Fig. 10). When the jacket is cemented in place, the cement filling these retentive cups will act as a wedge to prevent movement of the crown. Care must be taken in preparing the cups that the bur does not go through the crown. If the horns of pulp will permit it, retentive cups may be made proximally in the tooth to oppose the cups in the crown. Jacket crowns cemented in this manner will not become loose.

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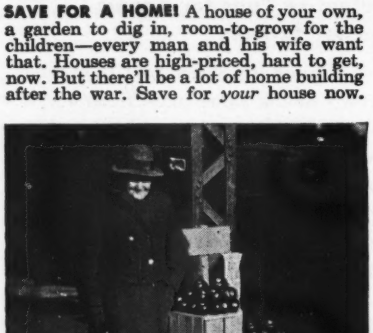

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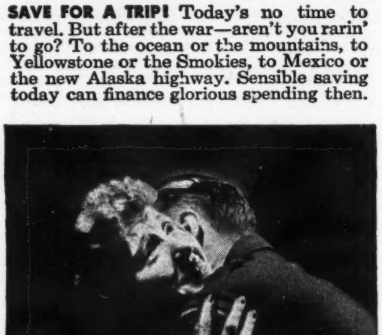

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Contra-Angles

Hidden Sweets . . . .

Every dentist is confronted frequently with the expressions of the distraught mother described by Kenneth A. Easlick, Associate Professor of Operative and Public Health Dentistry at the University of Michigan:[1] "During my child-bearing period I followed the advice of my physician. Three months after my daughter was born she was placed under the care of a pediatrician. Ever since she was old enough she has had four glasses of milk and a big glass of orange juice every day, green vegetables, whole-grain cereals and bread, and cod-liver oil; and now you find ten cavities in her teeth. I want to know, why?"

The answer given by Doctor Easlick is one that should be remembered by dentists and passed along more often to the public: "Usually I ask the mother this question, 'Does your daughter eat sweets?' And usually she replies, 'She eats very little. We have simple desserts like custards; she gets a little sugar in her fruit juice; she has a little sugar on her cereal; and she doesn't eat nearly so much candy as other children in the neighborhood—once or twice a day perhaps, always after a meal. When we have sweets, we have the natural sugars like jelly, jam, maple syrup, or honey.'

"Then I ask the question, 'Does your daughter chew gum?' Usually I get the answer, 'Yes, she likes gum and chews it every day. We think gum is much better for her, you see, than candy.' I remind the mother that a stick of gum has about a half-teaspoonful of sugar in it, and it is held in contact with the teeth until every last bit of sweetness is extracted.

(*Continued on page* 470)

[1]Easlick, K. A.: Schoolmaster Abroad, J. Canad. D. A., 10:356 (August) 1944.

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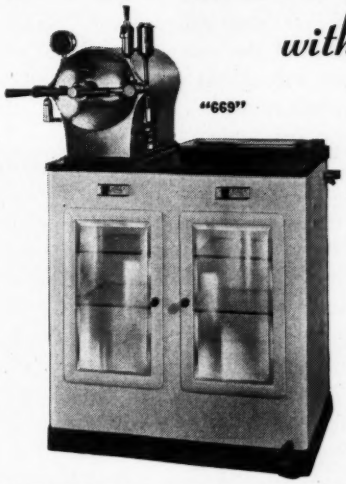

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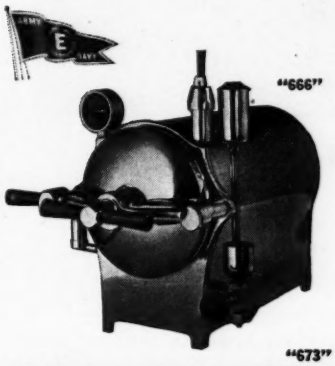

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"Then I ask, 'Does she like pop or other soft drinks?' Usually the reply is, 'Yes, she likes orange, or root beer, or some other flavor.' Again I remind the mother that some of these soft drinks have in them the equivalent of a tablespoonful of sugar per bottle.

"I again ask, 'Does she like chocolate milk?' Frequently I get the answer, 'Well, we had some trouble with her about milk, but she likes milk when it has chocolate in it and drinks it readily.' Once more I remind the mother that chocolate milk is sweetened milk.

"I may ask, 'Do you have much canned fruit in the winter months?' Almost always I get the reply, 'Yes, we like canned fruit.' I then have to recall the thick syrup that is on most canned fruit.

"I probably conclude with a question about white flour to find out about the amount of refined starch in the diet. I find that white flour is used in variable amounts. Some families eat white bread; some children nibble at crackers frequently; many families like hot biscuits; many families like heavy pastry desserts; and in some households grandmother still keeps the cookie jar well stocked. Where white flour is consumed, I have to point out that refined flour has lost its minerals with the husk and germinal portion of the wheat, and it consists, therefore, of almost pure, finely milled starch. Refined starch is readily broken down to sugar by a child's saliva.

"This bit of detective work, to search out the sugar in the family diet, is not an attempt to put the mother on the defensive—not at all. It does show the many ways in which sugar insinuates itself into the usual American family diet. Back in Paul Revere's time (Paul Revere, you know, was one of the earliest American dentists!), almost no pure sugar was consumed, and there was very little need for dentistry. Figures indicate that in the last year before rationing about one hundred and seventeen pounds of sugar per person were consumed in the United States. At

(*Continued on page* 472)

AMES PLASTIC PORCELAIN

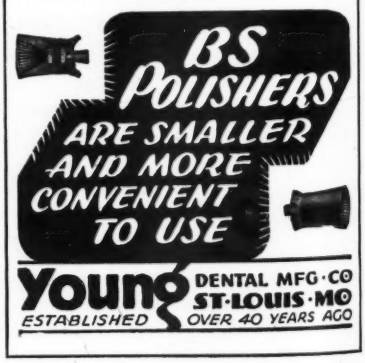
• You buy one bottle of Ames Plastic Porcelain at the "Quantity Price" when and as you need a translucent filling porcelain of markedly superior qualities. If you are not interested in the economy, you will be in the clinical performance of this authentic Ames product. Why not try it? The W. V-B. Ames Company, Fremont, Ohio.

BS POLISHERS ARE PREFERRED OVER MANY OTHERS

Because they build good will for the dentist—the importance of which cannot be underestimated.

Today, dentists realize that feat of discomfort keeps more people away from the dentist's chair than any other factor.

BS Polishers operate with safety and comfort which does much to do away with such fear. The soft, flexible rubber is cool and smooth in the mouth and does not throw or splatter abrasive. There are no turning metal parts to injure the mouth and the patient feels comfortable and at ease at all times. Why don't you use BS Polishers?



"The dentures I make... FIT!"
We know they do... Doctor...
. . . but here's how a Denture Powder helps Dentures that Fit!
The action of the periphery of a denture is similar to that of the perimeter of a suction cup. There's a definite valve sealing in both instances.
Even with a properly fitted new denture this valve seal may break. Dr. Wernet's aids in sustaining suction, eases period of adaptation.

Why more Dr. Wernet's Denture Powder is used than any other in the world

SOLUBLE—Because Dr. Wernet's is completely soluble, free of foreign matter, it sets up a resilient cushion that permits denture to ride close to tissues . . . does not establish bulk to destroy perfect fit.

NON-INCRUSTATING—Daily cleaning will dissolve and remove *all* traces of Dr. Wernet's, leaving no residue to incrustate in ridge areas. Insoluble powders can set up uneven pressure, cause mal-occlusion, the forerunner of dread pendulous tissue.

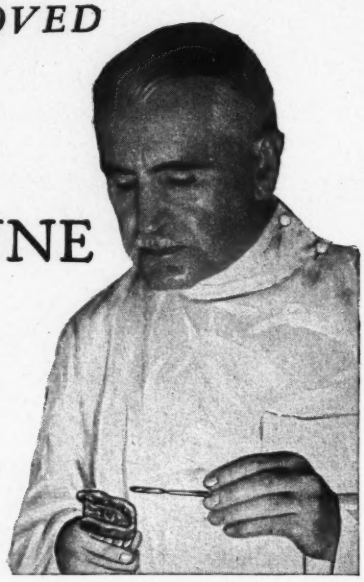
PURE, NEUTRAL—Chief ingredient in Dr. Wernet's Powder is so pure it is used universally as a binder in ice cream. Dr. Wernet's is harmless if swallowed, can not interfere with digestion, is not acid nor alkaline. **FREE SUPPLY** *on request: Wernet Dental Mfg. Co., Dept. 74-K, 190 Baldwin Ave., Jersey City 6, N. J.*

Dr. Wernet's POWDER

Adapts the Patient to the Denture

Don't Worry, Doctor,
The NEW, IMPROVED

DENTURLYNE



will help you correct the condition!

Constant research and experiment have resulted in a new, permanent material which will solve *all* your reline problems. The New DENTURLYNE, a big improvement over the former material, has a translucent pink color. It is placed in the mouth without the use of cellophane—and sets as hard as the denture base itself. It does not burn the tissues.

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your subscription to

THE DENTAL DIGEST

E A R L Y . . . .

THE DENTAL DIGEST, 1005 Liberty Ave., Pittsburgh 22, Pa.

the same time less than five young adults per hundred had escaped decayed teeth.

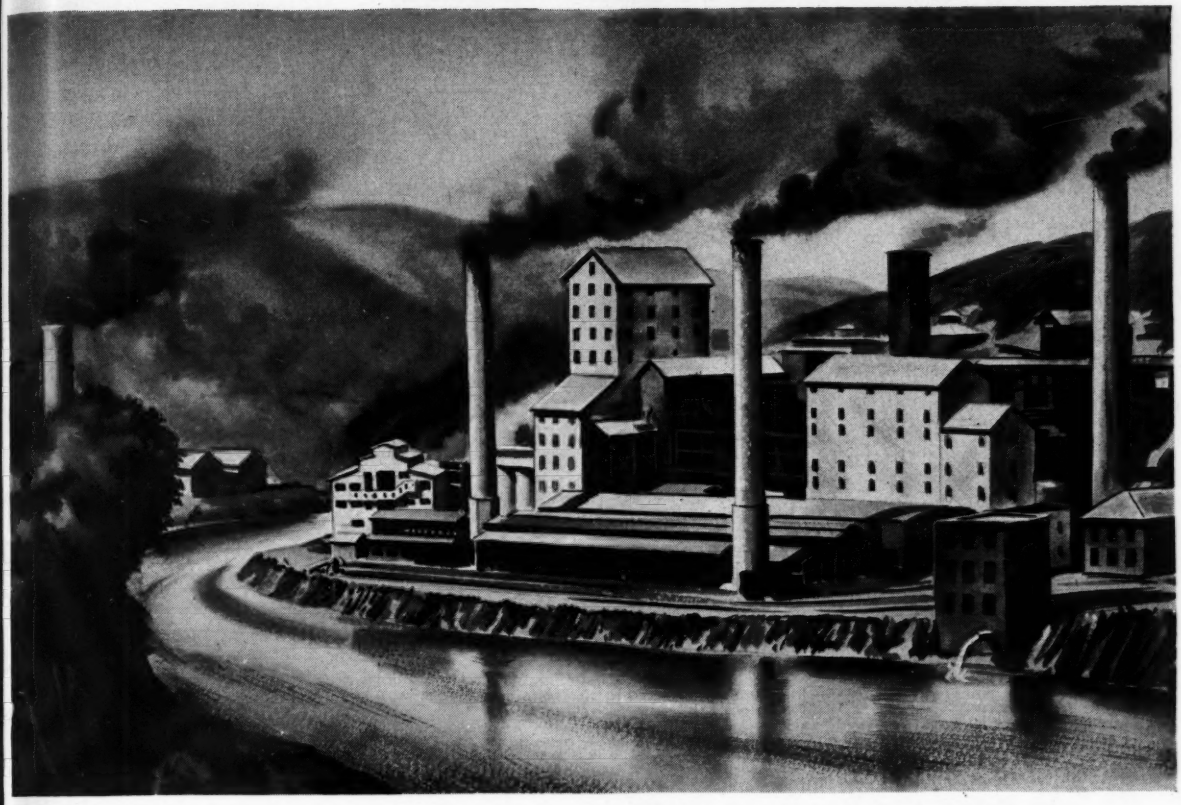
"Children, like automobiles, do not require 'ethyl' carbohydrates for quick starting; they can get along on 'regular' carbohydrates splendidly. Starting with a basic diet which has almost no sugar and very little starch in it, the acid-forming bacteria in a person's mouth can be reduced drastically in two weeks. At the end of that period four glasses of milk per day may be added, whole-wheat bread each meal, and potatoes for two meals; then any child or adult will have an abundance of starch and sugar for all energy demands. Balance studies have demonstrated the statement to be a fact that 'The starches in the primitive American-Indian diet are ample for all energy.'

"For the last six years I have watched sugar diets stop cavities for entire families in my own practice. One family has been unusually well pleased. After the initial cold plunge into such a diet, the two small daughters, father, and mother all found that they soon lost their appetite for sugar. The little girls were pleased because they had no further cavities (going to the dentist only to get one's teeth cleaned is fun!) Father and mother were pleased because they too had no more cavities. But more than that, the mother retained her girlish figure and the father lost an accumulated 'front porch.'

"I recommended a well balanced, well fortified diet for my patients; one sufficient in milk, eggs, butter, meat, colored vegetables, fresh fruits, whole-grain cereals, whole-grain bread, and cod-liver oil. I always add, however, 'Keep the sweets low to help prevent tooth decay!'"

The hidden sweets in chewing gum, soft drinks, chocolate milk, and denuded flour are a threat to every child's health. The dental profession may know that these sweets are present. We may indict them with all our energies, but to eliminate these hidden destructive agents from the American food habits is a stupendous undertaking.

(*Continued on page* 474)



CONFRONTED with a vast waste disposal problem, industrial plants utilize nearby rivers to effectively flush away all residue.

Similarly, in the intestinal tract, there is no more efficient method of evacuating waste than by the use of *liquid bulk*—as formed by Sal Hepatica plus water.

Clinical and laboratory tests prove that: ★ in the isolated loop of a dog's ileum, a laxative solution of Sal Hepatica increased the liquid bulk by 34 per cent in one hour. ★ in thistle tube experiments, a Sal Hepatica solution increased the liquid bulk by 100 per cent within 6 to 12 hours.

★ Sal Hepatica's liquid bulk helps stimulate bowel muscles, maintain a proper water balance. And the salines of Sal Hepatica help relieve gastric acidity, help promote the flow of bile.

Dentists find Sal Hepatica helpful in guarding against systemic infection during the treatment of Periodontoclasia, Pulp Infection, Vincent's Angina, Chronic Abscesses, Retained Root Fragment and Sinus Involvement.

Bristol-Myers Company, 19EN West 50th St., New York 20, N. Y.

TO HELP FLUSH THE INTESTINAL TRACT

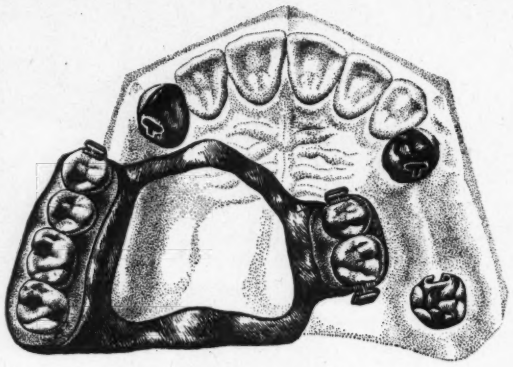
Sal Hepatica SUPPLIES Liquid Bulk!

Where Better Practice Indicates

PRECISION ATTACHMENTS

The use of Precision Attachments is indicated in this case because they eliminate need of a cumbersome continuous clasp across anteriors from cuspid to 1st bicuspid, which would be required in a clasp case in addition to clasps on the cuspid, 1st bicuspid and 2nd molar.

Precision attachments make the case more comfortable to the patient and more esthetic, avoiding the display of unsightly clasps, particularly on the cuspid and first bicuspid.



When Attachments Are Indicated, Specify

BROWN PROXIMAL CONTACT ATTACHMENTS

- Built-in Proximal Contact. Also made in Plain Shank Type.
- Ten standardized, interchangeable sizes.
- Strong—made in one piece, no seams or solder.
- Springy, positive retention.
- Simple to adjust. Use any sharp instrument.
- Closed bottom in male section makes insertion and removal of restoration easy for the patient.

Twelve Design Charts of Attachment Cases with Descriptive and Technical Literature on request.

ONE axiom has come out of the debate over the relative merits of clasp and attachment restorations—that neither type is a universal "best."

The important advantages of attachments are:

1—Life of the abutment tooth is greatly prolonged because, since the attachment is within the contour of the tooth, the stress applied is in line with its long axis; and also because possible erosion under a clasp is eliminated.

2—Esthetics is enhanced by eliminating a show of clasps, particularly on anterior teeth.

3—Attachments assure much more comfort to patient because of greater stability in a precision attachment and because all material on surfaces of teeth is eliminated.

The case illustrated is one in which "doctors agree" better practice indicates attachments for the reasons given.

Generally speaking attachments should be used:

- when the number and location of clasps required will form a too cumbersome or unesthetic appliance;
- when an abutment tooth lacks normal stability; a precision attachment will by itself immobilize the tooth without the addition of the indirect retainers necessary in clasp work;
- when the abutment teeth already accommodate the required inlays or crowns.

[*As makers of attachments, we are as anxious to discourage their use where contra-indicated as to encourage it where indicated.*]

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Impression

CORRECTIVE

Another LEE SMITH Achievement

A BETTER Oxy-Eugenol Corrective Wash

KREX mixes and handles with great ease . . . sets quickly or slowly in the patient's mouth as the case requires and according to your own mix . . . reproduces accurate detail. Truly a superior product! Order a box of KREX today and begin making *perfect fitting* dentures.

LEE S. SMITH & SON MFG. COMPANY

7325 Penn Ave. — Pittsburgh 8, Pa.

Let us consider the advertising carried on by the manufacturers of hidden sweets. In the case of chewing gum: On billboards, in magazines and newspapers, and over the air, the American people are told that chewing gum aids digestion and *cleans the teeth*. Most dentists believe that! Now concerning soft drinks: The various "colas" are everywhere—in filling stations, in self-dispensing stands, in every eating place. The millers, the bakers, and the candy makers, carry on an insistent campaign with millions of words costing millions of dollars to make more people eat more sugar and starch.

The manufacturers of the foods that carry hidden sweets are not diabolic conspirators against the health of the American people—not at all. They are smart business men operating with enterprise and imagination—for profit. They would prefer to believe that their products are healthful to consumers as well as profitable to the producers. It is conceivable that these producers might even change the composition of their products or reinforce them with vitamins and minerals if no serious threat to sales were concerned. The few dollars spent by professional organizations for public health education in all its forms are paltry and inconsequential when compared with the millions of dollars spent in advertising by the producers of hidden sweets.

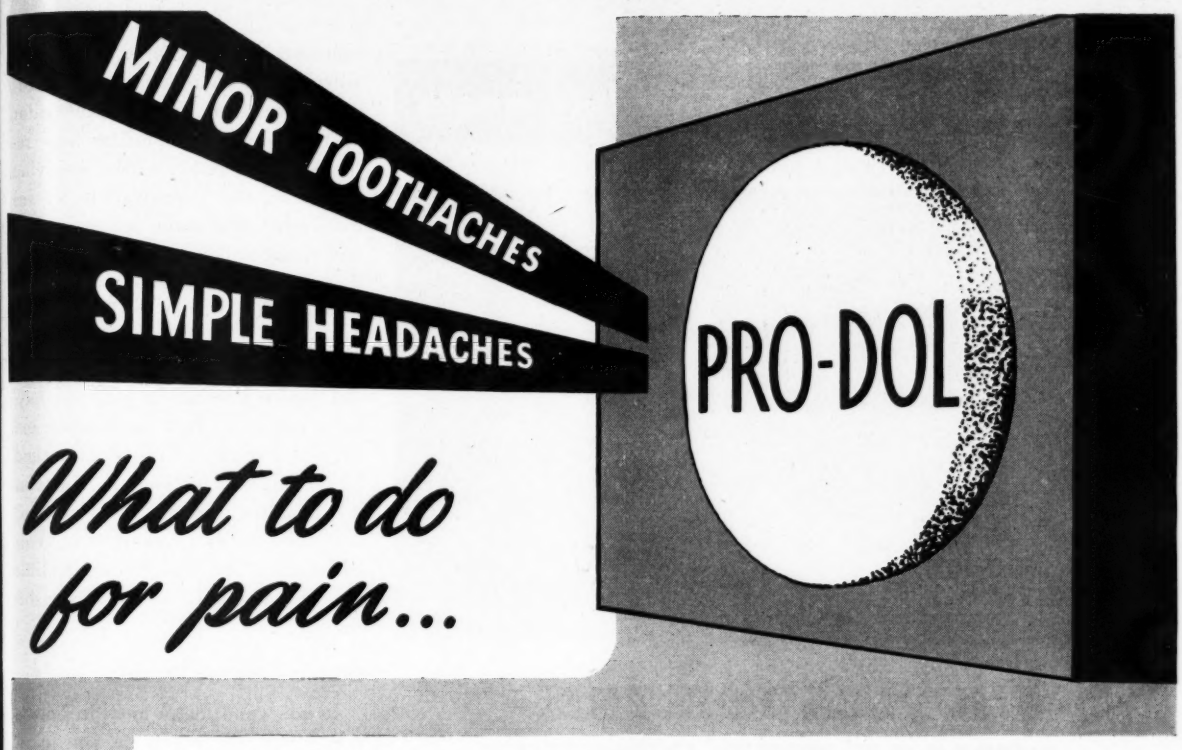
At present there are shortages in candy, chewing gum, and soft drinks for civilian consumers. This is to our advantage. Soldiers and sailors have been given priority to these sweets. It is too early to say, but many may have lost their teeth when they return from winning the wars.

One Little Letter . . .

It happened in the sedate and scholarly *American Journal of Sociology*.[2] An author in that publication said that the Writers' War Board had a "pro-Fascist mentality." The chairman of that board, Mr. Rex Stout, took a violent and proper re-

(*Continued on page* 476)

[2]Letters to the Editor, Amer. J. Soc., 50:142 (September) 1944.



What to do for pain...

PRO-DOL TABLETS are preferred by dentists and physicians for relief of minor toothaches, simple headaches and neuralgia. This product is offered to the dental and medical professions exclusively.

PRO-DOL affords effective aspirin therapy buffered and insulated against the side-effects of plain aspirin, minus the disadvantages of alkalis. It is well known that ordinary aspirin often irritates the stomach, due to liberation of acetic and salicylic acids. This acid irritation may be entirely avoided by prescribing or recommending PRO-DOL in place of aspirin.

In PRO-DOL therapy 5 grains of aspirin are scientifically incorporated with 7½ grains of dried aluminum hydroxide gel in each full dose. As soon as they are formed, irritant acids are neutralized and adsorbed.

No adjuvants are required. PRO-DOL's balanced formula provides automatic correction irrespective of the total aspirin needed for pain relief. An exclusive feature insulates aspirin from gel inside each tablet until used.

DOSAGE: 1 or 2 tablets, repeated as required, for minor toothaches, simple headaches and neuralgia.

HOW SUPPLIED: Boxes of 24 and 60 flavored tablets, each tablet individually wrapped in Sanitape.

Write Dept. DD-10 for professional samples and literature

THE PRODOL CO. INC., 50 EAST 42nd ST., NEW YORK 17, N. Y.

In your ORAL HYGIENE this month

A PLEA FOR THE DEMOBILIZED DENTIST

—for the returning dentist who will need help in reestablishing himself—is made in October ORAL HYGIENE by Doctor Hugh E. Black, veteran of both World Wars. He had been a member of the Illinois State Board of Dental Examiners for thirteen years when called to active duty as a reserve officer. "It is," he says, "one thing to stand up in a society meeting and orate on dental ethics, and another to make practical application of ethics," and the "truly ethical practitioner can help the demobilized dentist by sending patients back to him."

"So You Know Something About Dentistry!" is a new ORAL HYGIENE department, a quiz to test your memory—and knowledge. It is conducted by a dental college professor.

"Volunteers are Trained to Aid Dentistry" and two picture-pages tell about this project.

"The Hygienist is the Answer," believes Doctor Arthur A. Campbell, who outlines suggestions for meeting the shortage of dentists.

"Help for Each Other" advocates a constant interchange of ideas between the American and British Dental Associations. The author, Edward Samson, L.D.S., is president of the British Association.

"Professional Net Incomes" is a chart page contrasting dentists', physicians' and lawyers' incomes.

"Faces Remade," by Doctor Arthur Elfenbaum of University of Illinois College of Dentistry, tells why dentists should prepare to perform facial prosthesis for returned soldiers. "You can do it—and what a sense of satisfaction is in store for you when you make that boy, his family and his friends, forever grateful to you."

"Citations for Heroism" records the decorations and awards so far conferred upon Army Dental Officers by the War Department.

This month's eight departments include Technique of the Month, Ask ORAL HYGIENE, Military News, Dentists in the News, Picture of the Month, Editorial Comment, Laffodontia, and The Publisher's Corner.

sentment to that charge. After considerable acrimonious correspondence between Mr. Stout and the editor of the journal, the matter was referred to the author of the annoying statement. On investigation it was discovered that some printer's devil had changed the original manuscript that read "pre-Fascist" to "pro-Fascist." One letter makes such a difference!

It is one thing to think as people did *before* Fascism. It may, in fact, be a complimentary expression and express a spirit of individualism and pioneering self reliance. It is serious and insulting, however, to be charged with thinking as a Fascist or in favor of Fascism. The change from the little "e" to the round "o" makes the difference.

Dentists for the World . . .

It is a good many months since a prediction was made by this commentator that American dentists might expect to find themselves practicing in faraway places after the war. Since we have embraced internationalism with fervor and have appointed ourselves the good providers for the world, it follows that we will continue to give succor to the universe and all its people after the fighting is over. We are already giving food and providing shelter and homes, and are beginning to supply health services. Within the next few months we may expect more and more dentists to be assigned from federal agencies to serve with the United Nations Relief and Rehabilitation Administration.

This is what the platform of the UNRRA says about health and welfare programs:[3] "Reports received from the occupied countries indicate that the United Nations will have to act swiftly to prevent the spread of epidemics; thousands of lives are being taken by typhus and tuberculosis. The UNRRA Council laid plans to send life-saving teams of doctors and nurses behind the liberating armies to fight disease and starvation. A

[3]Helping the People to Help Themselves: The Story of the UNRRA; prepared by United Nations Information Office, New York.

(*Continued on page* 481)

(*Continued from page 476*)

staff of doctors and technicians will be gathered from all nations and standard units of medical supplies are to be assembled. After first emergencies have been met, the Council agreed, UNRRA will then attempt to provide assistance to governments to enable them to re-establish health services in the least possible time.

"An important function of the UNRRA's health organization will be epidemic control, particularly epidemics affecting more than one country. Early recognition will be given to the needs of children and expectant and nursing mothers, for upon them depends the restoration of normal family life. Special measures will be taken to deal with communicable diseases among children, particularly those who are homeless and lost, and whose resistance has been lowered by malnutrition.

"Welfare was defined by the Council to include the necessities of life for those persons unable to provide for themselves. Welfare services will be designed to help people to help themselves; and UNRRA will also enlist the cooperation of voluntary relief agencies who have been or are working in the field."

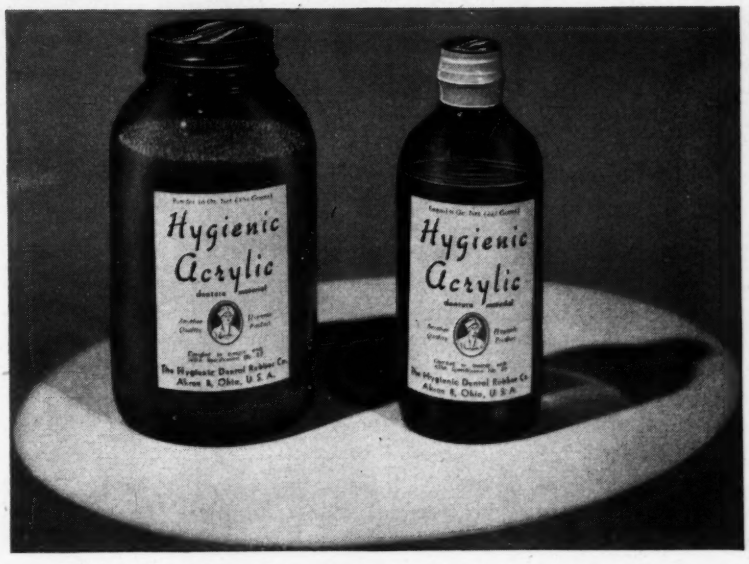
Some of the dentists who went to war to fight the Axis will learn that they will not be coming home for a long time after the shooting is over. —*E. J. R.*

DENTAL MEETING *Dates*

Massachusetts Alpha Omegans, in service in this country or overseas, please communicate with Doctor Abraham Gurvitz, War Service Committee, Alpha Omega Fraternity, 371 Commonwealth Avenue, Boston.

•

The Women's Dental Society of New York City, regular meeting, November 15, Hotel Pennsylvania, New York City.



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Uniform color and texture.
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Try a Package at Our Risk

Make as many dentures as you wish. If Hygienic Acrylic does not satisfy you in every respect, your money will be refunded.

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The Hygienic Dental Rubber Co., Akron 8, Ohio.

Please send me through my dealer one lb. of Hygienic Acrylic at 25 lb. rate ($7.00). If I am not satisfied I wish my money refunded.

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OUR BEST HABIT

. . . says the Axis

It's American sociability! We love to get together and . . . *talk*. We talk about our work . . . about what we see, or hear from others . . . about latest letters from our boys.

Then others repeat our words to others . . . and others . . . and others . . .

From 10 . . . 50 . . . 200 random phrases about our war production or our boys in uniform, expert Axis agents piece together *one* important military secret which *you* may help betray . . . just by being sociable!

Don't repeat even *little* things about our war program unless they've been published or broadcast. Think *before* you talk!

Surgical Methods for Relief of Pain in the Head and Neck

FRANCIS C. GRANT, M.D.

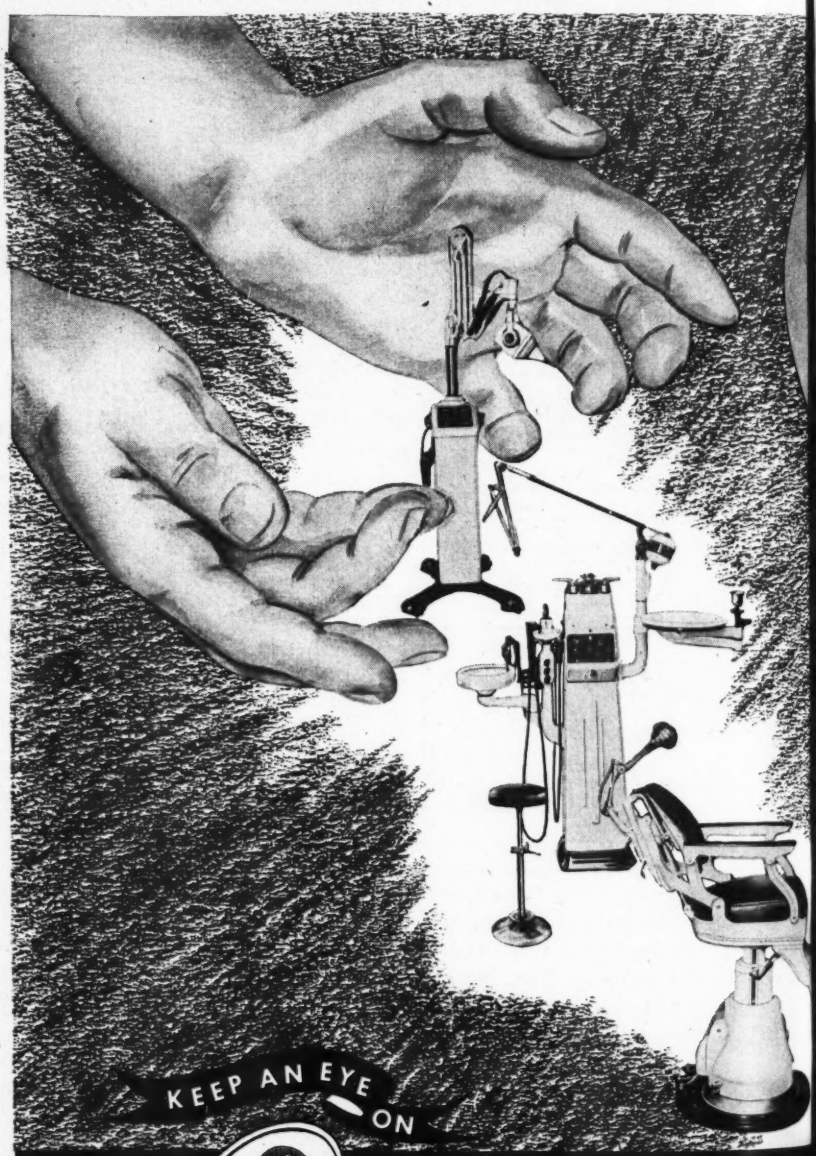
THE AFFERENT pathways for pain in the head and neck run through the fibers of the fifth, ninth, and tenth cranial nerves; the upper four crevical posterior roots; the sympathetic fibers connected with these nerves; and the larger arteries supplying this area. To cut the afferent pathways would relieve the pain. Trigeminal neuralgia is an example of this reasoning: cut the sensory root behind the ganglion, and the pain in the face is relieved. This is true, but the patient pays a price for the relief of his pain, a price sometimes higher than either the surgeon or the patient anticipates.

Complications

A serious complication of complete sensory root section, keratitis in the ipsilateral eye, can be prevented by subtotal section of the root. Facial paralysis occurs in about 5 per cent of patients who undergo root section; comes on four or five days postoperatively; and is fortunately not permanent, disappearing in from three months to six months. The most serious possible complication following root section is the anesthesia of the face necessary to relieve pain. This anesthesia is permanent and continuously present.

About 25 per cent of the patients will grumble about the stiffness, swollen feeling, and apparent lack of mobility in the affected side of the face. They are everlastingly grateful for the relief of the paroxysmal, devastating pain, but never fail to complain about the numbness of the face, fullness in the ears, and stiffness of the tongue.

In another 5 per cent, this anesthetic area develops a persistent burning sensation. The paresthesia is continuous night and day, and finally is much more distressing to the patient than was the former intermittent neuralgia. If a carefully detailed preoperative history reveals that the cheek or lip burns between the paroxysms of pain, the patient should be advised that this sensation may persist after root section has relieved the major distress. A better method of preventing this complication is the use of alcohol injection of the appropriate branch of the trigeminal nerve. By this means two purposes can be accomplished: (1) A definite diagnosis of major trigeminal neuralgia can be made (unless



Relief of Pain in 218 Cases of Carcinoma of Head and Neck		
Position of Growth	Number of Cases	Percentage Complete Relief
Skin of cheek	24	19 or 80%
Neck	9	7 or 77%
Mandible	37	25 or 70%
Maxillary antrum and upper jaw	58	38 or 65%
Mucous membrane of cheek	12	7 or 60%
Tongue surface and sides	21	12 or 60%
Base of tongue and tonsils	50	21 or 40%
Ethmoid and sphenoid sinuses	7	2 or 28%
Total	218	131 or 60%

a successful injection relieves pain. true trigeminal neuralgia is not present); and (2) the patient is introduced to the anesthesia of the face which he must accept for relief of pain. The anesthesia following alcohol block is, of course, temporary. Within eighteen months the sensation of the face will return to normal and the pain will recur. If the patient wants operative section of the root anesthesia, he knows exactly how his face will feel following the operation.

Pain Due to Carcinoma

Pain due to carcinoma of the face and neck can be relieved at a price. The foregoing chart shows that the results following available methods are not brilliant. Of seventy-six patients who underwent operations, eleven, or 14.4 per cent, died. Inasmuch as these figures go back about twenty years, many earlier cases are included in which more complete re-

The Magic Touch
OF SKILLFUL PLANNING...

Wherever Weber Equipment has been on display during the past year, everyone has marveled at the many new revolutionary improvements which have been incorporated in the Weber Equipment line. Foremost among these is the new Model "7" RayDex X-Ray, with a host of features too numerous to mention . . . the new, improved Majestic Units . . . the new Magic Rest Stool, and last but not least, the amazing new "back-lifting" mechanism which is built with "compensating arms" of the Weber Model "F" Foot-Pump and Motor-Base chairs. This ingenious feature has been acclaimed as one of the most important improvements in dental chair construction in years.

Thus, the magic touch of skillful planning has not only manifested itself in Weber's splendid war-production record but in the fulfillment of a promise to produce the finest dental equipment possible for the dental profession when peace comes.

WEBER DENTAL MANUFACTURING COMPANY, Canton 5, Ohio

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Y... UCERS OF FINE DENTAL EQUIPMENT

For PERMANENCE

BOSWORTH'S CEMENT AND LIQUID MEASURING DEVICE

Prevent disintegration of the seal between inlay and cavity by having an assured powder-liquid ratio with Bosworth's Cement and Liquid Measuring device. The definite powder-liquid ratio obtained, the cement in measured capsules and liquid in hermetically sealed cartridges, produce dependable, uniform mixes. It takes the guesswork out of cementation.

THE KILE MIXING SLAB

Definite control in mixing cement and silicate is assured with the "air-conditioned" polished black Kile Slab. This automatic self-cooling slab is always below room temperature yet never reaches dew point. Makes mixing accurate, simple, easy.

HARRY J. BOSWORTH COMPANY
1315 S. MICHIGAN AVENUE · CHICAGO

lief could have been produced by methods now available. This is particularly true in the group in which the carcinoma involved the floor of the mouth and the tonsils. The high mortality is due for the most part to the unwillingness of the attending physician and the patient's family to submit the patient to more radical methods than the use of opium for the relief of pain until he has reached a stage of general debility which makes him an unsatisfactory surgical risk.

The medical profession at large is averse to surgical treatment for pain due to carcinoma. As general experience increases and as realization grows that certain malignant lesions in the face and neck will inevitably become painful, however, the patient will be referred for surgical relief as soon as the first evidence of pain appears and before he has been reduced to a poor surgical risk by the disease and continuous suffering.

—From Pain: Proceedings of Association for Research in Nervous and Mental Disease, December 1942, Baltimore, The Williams and Wilkins Company, 1943, pages 408-415.

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136 West 52nd Street New York 19, U. S. A.

Chemosurgical Treatment of Carcinoma of the Lip

Technique

The chemosurgical method for the excision of accessible forms of carcinoma under microscopic control was introduced by F. E. Mohs. The tissues in question are fixed in place by means of a suitable solution of zinc chloride, and then are excised and examined microscopically. This process is repeated if necessary until microscopically carcinoma-free surfaces are reached. The fixation of the tissue by zinc chloride does not interfere with the microscopy.

Results of Study

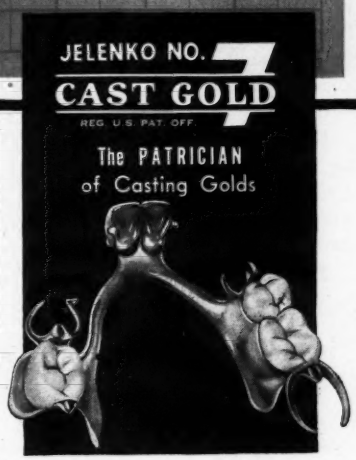
A special clinic was established in the department of surgery in the University of Wisconsin eight years ago, and since then many hundreds of carcinomas have been subjected to the chemosurgical treatment. The first report, which covers the patients treated between July 7, 1936, and May 29, 1943, deals with carcinoma of the lip. The cure rates are 91.5 percent of the 164 patients after six months, 59 per cent of 73 patients after three years, and 87.5 per cent of 38 patients after five years.

Advantages

1. The microscopic control of excision gives the method an unequaled advantage in that unsuspected outgrowths of small caliber from the main tumor mass were found microscopically, at times extending a considerable distance after becoming grossly invisible.

2. The method is almost without

A Record ...of Professional Preference



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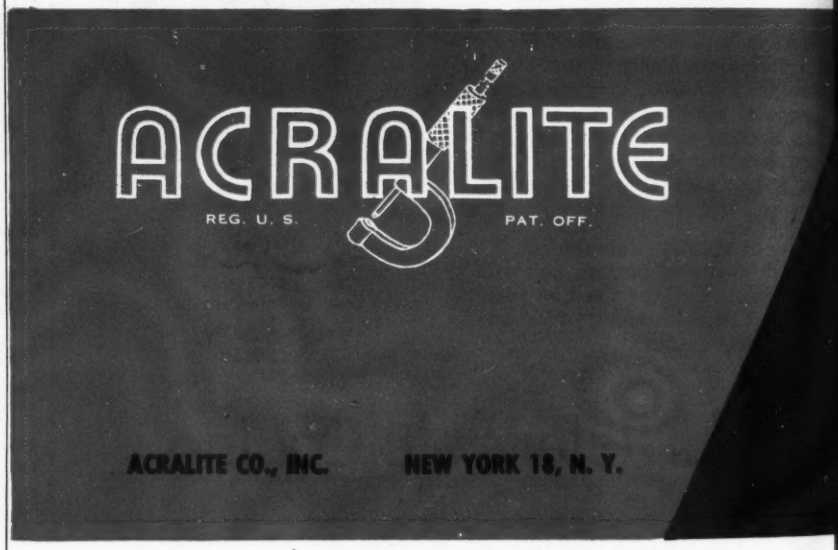

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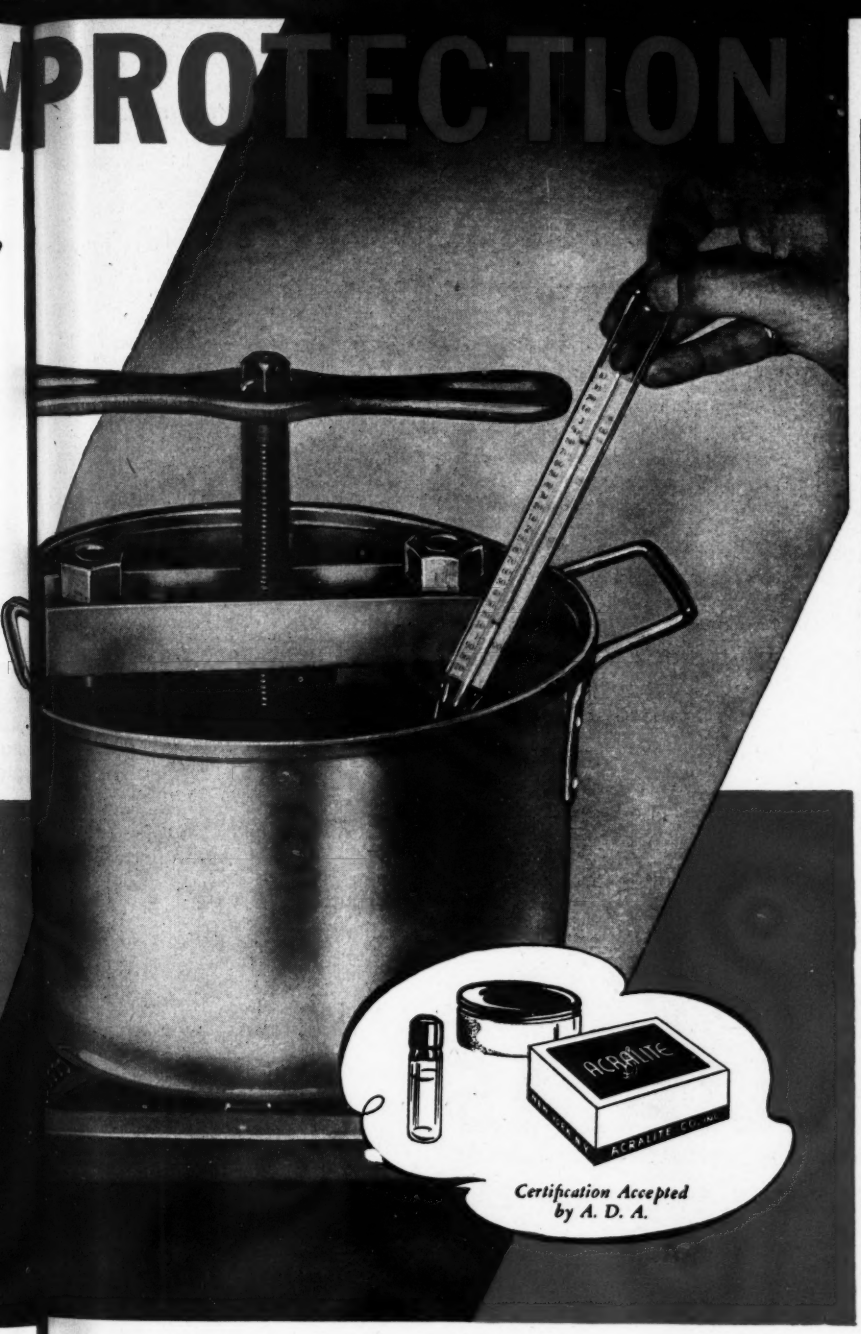

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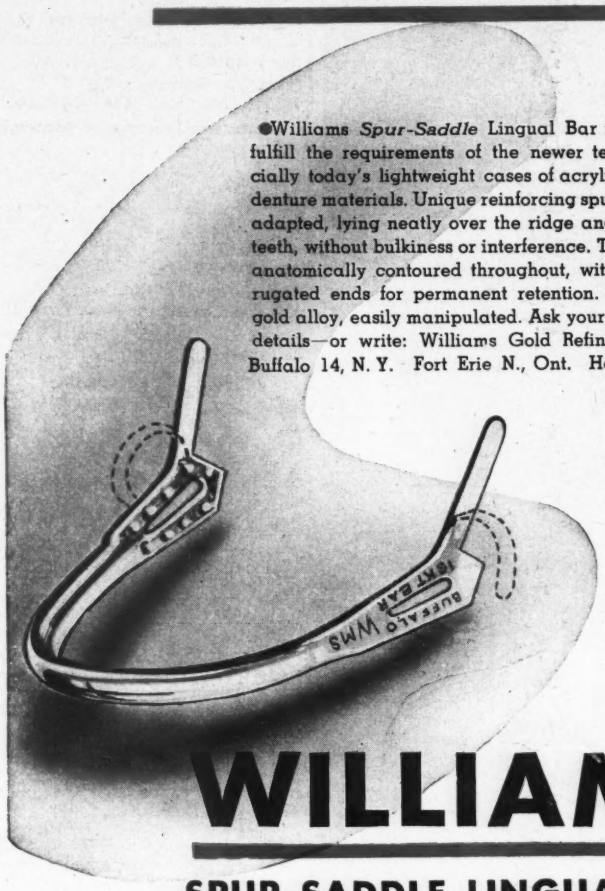

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